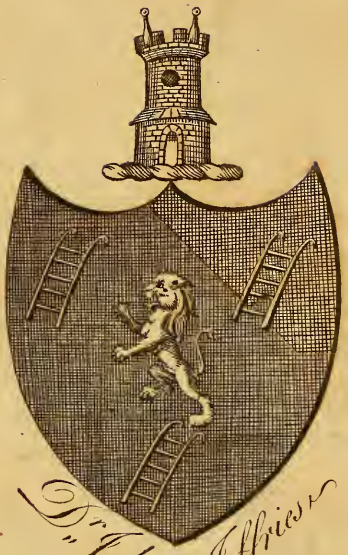
Dr. John Jeffries

# TREATISE

ON THE

# Diſeaſes of Women;

In which it is attempted to join a juſt Theory to the moſt ſafe and approved Practice:

WITH

Two Diſſertations on ſeveral Paſſages in the Treatiſe on the Diſeaſes of Women; in which it is endeavoured to remove ſome Doubts which have ariſen concerning them:

Tranſlated from the FRENCH Original;

Written by the late Dr. *J. ASTRUC*, Royal Profeſſor of Phyſic at *Paris*, and conſulting Phyſician to the King of *FRANCE*.

*In hoc gaudeo aliquid diſcere, ut doceam: nec me ulla res delectabit, licèt eximia ſit & ſalutaris, quam mihi uni ſciturus ſim.*
Senec. *Lib. I. Epiſt.* 6.

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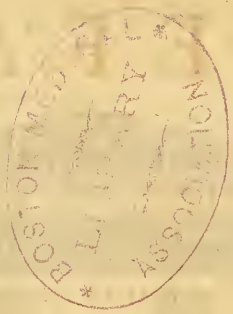


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# PREFACE.

I HERE acquit myſelf of my promiſe, in publiſhing the two laſt books of the *Treatiſe on the Diſeaſes of Women.* There will be found, in the firſt of them, ſeveral queſtions, which are difficult, knotty, and obſcure: nor can it be a matter of wonder. The explaining generation is the ſubject: and it is well known, how much generation is a myſtery of nature.

Within the period of one hundred years, anatomiſts and phyſicians have made many very uſeful, and very important diſcoveries on this matter: which have given great lights into it. *Multum agerunt:* but there is much wanting to the clearing up all doubts, *ſed non peregerunt.*

Seneca, from whom I borrow this Latin paſſage, after having ſaid thus in cir-

cumſtances ſomewhat ſimilar to thoſe in which I now ſtand, though with reſpect to a different ſubject, added, that there yet remained much more to be done, to explain the matter of which he treated: and that a thouſand years would not be ſufficient to complete it. *Multum adhuc reſtat operis*, ſays he, *multumque reſtabit*; *nec ulli nato poſt mille ſecula, præcludetur occaſio aliquid adhuc adjiciendi.*

However long the time might be, that Seneca took for the perfecting the ſubject of which he ſpoke, without preſuming to hope it, I go yet further than him, with regard to generation: and am perſuaded, that it can never be attained, to reſolve all the difficulties which attend this ſubject. Becauſe they are hidden in the profundity of the wiſdom of God, the Author of Nature, whoſe ways are impenetrable. Fully ſenſible of this truth, it may be well judged, that I do not bluſh to confeſs my ignorance when an occaſion is preſented for it. I even find a kind of ſatisfaction in acknowledging it; becauſe I am not ſorry

ry at humbling the preſumption of ſome philoſophers, who dare to judge of the meaſures of Deity, by their own feeble underſtandings; but on the contrary I am very glad to render them ſenſible, that there are, even in the order of nature, incomprehenſible myſteries; and that, in ſuch caſes, the only method, philoſophers can purſue, is to admire, and adore the works of God; and the extent of his power, without endeavouring to fathom them; for fear of falling into groſs error.

I have followed, in theſe two laſt books, the ſame principles, and order, as in the four preceding. When there is occaſion to treat of any diſeaſe, I have explained in diſtinct articles, the deſcription, cauſes, ſymptoms, diagnoſtic, prognoſtic, and method of cure.

With reſpect to the phiſiological queſtions, which it is neceſſary to diſcuſs, in the third book, relating to pregnancy, and the diſeaſes which depend on it, I have divided, as far as I could, the general topic into ſeveral ſubordinate

queſtions; to each of which I have endeavoured to give a ſeparate diſcuſſion: in order to deduce thence the ſolution of the principal queſtion. I propoſed, by this means, to gain brevity; and, what is of much more importance, perſpicuity. I always made this the object of my endeavours; and I ſhall eſteem myſelf happy if I have attained to it.

There will be found, at the end of this volume, two diſſertations. The one, an attempt to remove the doubts, that Mr. Van Swieten appears to have, relating to the diſtribution of the veins of the *uterus*, which I have mentioned in the firſt volume of this work: and which I taught a long time at Montpellier and Paris.

The eminence and politeneſs of this learned phyſician, merited ſuch notice from me, and I have neglected no means of proving to him, that if what I have advanced, regarding the veins of the *uterus* be new, it has been, at leaſt, preconceived in a general view by ſeveral anatomiſts of the firſt rank: and that the degree

degree of knowledge they had of it, ought to give additional weight to what I have ſaid farther.

In the other diſſertation, I anſwer ſome criticiſms, that have been made in the *Journal des Sçavans*, on the two firſt volumes of this work. Theſe criticiſms turn on queſtions of phyſiology, of no conſequence to medicine; and they were delivered with ſo much politeneſs, that I might eaſily diſpenſe with paſſing them over in ſilence: but whoever believe themſelves in the right, like to be juſtified; and I yielded to that impulſe.

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TREA-

From Kaekringius. Pl. I.

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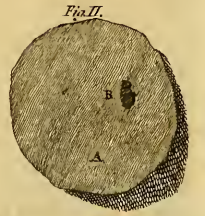


Fig. I.



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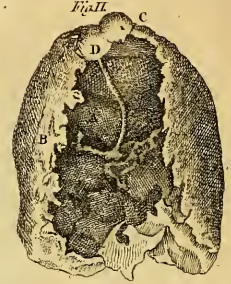


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Fig. VII.

Fig. VIII

Fig. IX.

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Fig. I.

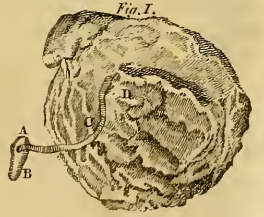


Fig. II.

Fig. V.

Fig. VI.

# TREATISE

ON THE

# Diſeaſes of Women.

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## BOOK THE THIRD.

### Of pregnancy, and the diſeaſes dependent on it.

---

### CHAPTER THE FIRST.

*Of the parts of generation in women.*

I HAVE given, in the beginning of the firſt book of this work, a ſimple deſcription of the *uterus*; the blood veſſels which are diſtributed in it; and the lactiferous, or vermicular veſſels, that are there obſerved in pregnant women. This was all that appeared neceſſary, in order to explain thoſe female diſeaſes of which I have already treated: but, as the ſubject of this book is PREGNANCY, and the DISEASES ariſing thence in ſome caſes, it is now requiſite to enter into a more particular detail of the parts of generation in women; that is to ſay, of the *uterus*, *ovaria*, and Fallopian tubes; all which are intended to be ſubſervient to this important function. I ſhall be brief in my deſcription of them; but ſhall endeavour, never-

theleſs, to avoid omitting any thing that may be eſſential.

## § I. *Of the uterus, and its parts.*

The *uterus* is ſituated betwixt the bladder and the *rectum*; and placed in the baſon, between the *os innominatum*, and the *os ſacrum*; where it is ſunk intirely in its natural ſtate: but, in the laſt month of pregnancy, it riſes higher. It is difficult to determine the figure, volume, and capaciouſneſs of the *uterus*; becauſe it changes in thoſe reſpects, as well with relation to the age of women, as to other circumſtances under which they may be. In girls, who have not had the *menſes*, it is little, hard, and of a ſhape almoſt triangular, a little flattiſh in the fore and hind parts; and has ſo ſmall a cavity, that it can ſcarcely contain a little bean. When the *menſes* begin to appear, and more eſpecially when they are confirmed, the *uterus* is ſomewhat bigger, rounder, more ſupple, and ſoft; and its cavity becomes then capable of containing a little almond. In women, even that have had no children, the volume, roundneſs, ſoftneſs, and capaciouſneſs of the *uterus*, are augmented by the uſe of coition; but they are much more augmented in thoſe who have had ſeveral. But in ſuch, as have loſt the *menſes* by age, the *uterus* contracts its volume again; becomes cloſe; and grows hard: which changes ſtill gain ground in proportion to the age. The far greateſt increaſe of the magnitude of the *uterus* is, nevertheleſs, during the laſt months of pregnancy. It is then round, and pulpous; and its cavity is ſo much dilated, that it contains a *fœtus*, which weighs 12, 14, or 15 pounds; beſides a *placenta*, and the waters incloſed therein; which weigh near as much. In the *uterus* are diſtinguiſhed the ſuperior part, or *fundus*, where the cavity is the largeſt; the lateral parts, right and left, anterior, and poſterior; and the inferior part or neck, where it tapers: which gives the whole figure

of the *uterus* ſome ſlight reſemblance of a pear. The neck of the *uterus* falls a little into the *vagina*; and there makes a projection, that is like the ſnout of a whelp; and, in the middle, of this, is an aperture croſſwiſe: which is the orifice of the *uterus*; and affords a paſſage to the child in the delivery.

It is not to be doubted, but that this orifice remains cloſed in the ordinary ſtate, and particularly during pregnancy, by means of a conſtrictive muſcle, formed of many circular figures, which ſurround it: and there is, on the contrary, equal evidence, that it is open during conception and delivery, by the contraction of the radious fibres which ſurround it. A ſimilar mechaniſm is ſeen in ſeveral other parts, for leſs important functions. There are muſcles to dilate and contract the *pharynx* in deglutition; the *anus* in going to ſtool; and the pupils of the eyes in viſion. Could, therefore, the author of our being, ever attentive to procure all advantages in the ſtructure of our bodies, leave the opening of the orifice of the *uterus* in delivery to the ſole action of the head of the child? Or could he have rendered conception very uncertain, or contingent, for want of having put the orifice of the *uterus* in a condition to open itſelf properly, to receive the ſeminal fluid? But, though what I have here advanced be very plauſible, I am yet content it ſhould be regarded as a conjecture, till ſuch time as it may be confirmed by obſervation.

In young girls, this orifice is but very ſmall; when they come to a marriage-ſtate it is larger; and bigger ſtill when they are full-grown women. Except in the time of pregnancy, it is generally cloſe; but during that time it is ſtopt up, by a kind of mucilaginous lymph, collected and filtered in the glands, that are at the neck of the *uterus*.

In moſt women, the edges of this orifice are even, pulpous, and ſoft; and from thence it may be preſumed they will yield eaſily, and without danger, to

the dilatation in delivery. In ſome, they are uneven, hard, and almoſt ſchirrous; and, conſequently, unfit for diſtention, or to ſuffer the orifice to be eaſily dilated. They are, moreover, in others, thin and flat; which renders them capable of being diſtended readily and eaſily: but, with this diſadvantage, that they are ſubject to be eaſily lacerated in a greater or leſs degree; which is always attended with danger.

It is commonly thought, that, in proportion as the *uterus* dilates in pregnancy, all its parts grow thicker. This may be true, as to that place in it where the *placenta* is attached to it: for there it grows thick enough to ſuffer the veins, which are diſtributed in it, to become ten times bigger than they are in the natural ſtate. But the reſt of the ſubſtance of the *uterus* retains its ordinary craſſitude, without any augmentation; which does not, nevertheleſs, prevent the volume from being much enlarged by the diſtention, which the *uterus* undergoes at that time: ſince, in women who die in delivery, it is found to weigh even two pounds; though, in the natural ſtate, it does not weigh more than two or three ounces.

The *uterus* is affixed to the parts which ſurround it: to the *vagina*, by its neck; as has been already ſaid: to the *rectum* and bladder, by the expanſion of the *peritonæum:* to the *vertebræ* of the loins, and the *os ilium*, by the broad ligament; which is only an expanſion of the *peritonæum:* and to the groins, by the round ligaments. It is perforated laterally in its *fundus*, both on the right and left ſides, by the extremities of the two *Fallopian* tubes, which open into its cavity, for uſes that will be explained below.

There is a received opinion, that theſe openings are beſet all around with radious fibres, proper for dilating them when they are contracted; and that, on occaſion, they do dilate them.

II. There

II. There is found in the *uterus*, as in all other parts, nerves, arteries, veins, and lymphatic veſſels. The nerves are diſtributions of the intercoſtal, or nerves of the ſpinal marrow; which paſs out through the holes in the *vertebræ* of the loins, or thoſe of the *os ſacrum*. The arteries come from the ſpermatic, hypogaſtric, or internal hæmorrhoidal branches; according to the different parts of the *uterus* where they are diſtributed; that is to ſay, the ſuperior, middle, or inferior. The veins, which carry back the blood from the *uterus*, terminate, according to whence they come, in the ſpermatic, hypogaſtric, and internal hæmorrhoidal veins. The lymphatic veſſels, after having abſorbed the lymph, convey it into the glands of the bifurcation of the *aora deſcendens*, from whence it paſſes into the glands of the meſentery, and thence into the *receptaculum* of Pecquet, according to the courſe of the circulation of lymph.

Theſe ſeveral veſſels are diſtributed in the body of the *uterus*; which is formed of three membranes: the *exterior*, or *tendinous*; which is a production of the *peritonæum*; and covers the bottom and ſides: the *middle* or *carnous*, pretty ſimilar to the carnous membrane of the inteſtines or ſtomach; and formed in the ſame manner, of a great number of fleſhy fibres, very apparent in the *uterus* of pregnant women; ſome of which are longitudinal, and go from the *fundus* to the orifice; others are oblique in two different directions, from the right to the left, and from the left to the right; and the greateſt number are circular, eſpecially towards the *fundus* of the *uterus*, where Ruyſch has taken them for a particular muſcle; which he has called the *muſculus orbicularis uteri:* and the *interior*, that lines the inſide of the *uterus*, and is ſo thin, that Mr. Mery has miſtaken it. This membrane is capable of diſtention; and perforated with a great number of little holes, imperceptible in its ordinary ſtate; but which become very diſtinguiſhable towards the end of pregnancy; and are ſo

many mouths of the blood-veſſels and lactiferous veſſels below deſcribed. It is pretty ſmooth and even, in the reſt of the *uterus*; but folded towards the neck; where it forms ſeveral *rugæ*, or wrinkles, which ſerve to facilitate the diſtenſion in delivery. There are commonly found among theſe *rugæ*, ſeveral little ſpherical *veſiculæ*, full of a viſcid lymph; which a phyſician of Leipſic (Martin Naboth) would have paſs for actual *ova*, deſigned for the formation of the fœtus.

The uterine arteries, after many ramifications, often repeated, and ſeveral windings about, terminate at length in a prodigious number of capillary arteries; which communicate with an equal number of capillary veins. Theſe ſmall veins have yet more numerous windings than the arteries; and, after ſeveral inoſculations, terminate at laſt in one of the three before-mentioned veins, which carry back the blood from the *uterus*.

Beſides theſe direct *anaſtomoſes* of branches of arteries, with branches of veins, there are, in the *uterus*, a great number of lateral *anaſtomoſes*, between the branches of arteries, and branches of veins ſeparately; which form two diſtinct net-works, one arterial, and the other veinal, very apparent every where, betwixt the carnous membranes, and the internal, in the *uterus* of pregnant women; but particularly in the place where the *placenta* adhered.

From the greateſt part of the knots of the veinous net-work, that is to ſay, from the places where two veins reunite, little projections or *appendices* of veins riſe on the inferior ſide of the membrane of the *uterus*; which perforate it; and are naturally cloſed up on that ſide: whence they have been ſometimes called *cæcal* veins: but which open, on certain occaſions; and ſuffer blood to flow from them into the cavity of the *uterus*. As in the time of the *menſes*; in the time when the blood ſhould be furniſhed to the *placenta*, for the nouriſhment of the

*fœtus*

*fœtus* in the time of the red *lochia* after delivery; and in the time of floodings.

Theſe veinous, or cæcal *appendices*, are ſcarcely perceptible, except in the *uterus* of pregnant women, during the laſt months of pregnancy. But then it is found, that they project into the *uterus*, at the place where the *placenta* adheres, for three or four, or ſometimes even five lines; that, by theſe elongations they bury themſelves, or if I may uſe the expreſſion, ingraft themſelves in proportionable hollows or niches, which they have made in the ſubſtance of the *placenta*; that they contribute, by theſe means, to ſtrengthen the adheſion of the *placenta* to the *uterus*: and laſtly, that, in the courſe of pregnancy, they emit, by their extremities, which open, the blood of the mother into the *cellulæ* of the *placenta*, from whence it is taken up by the umbilical veins, and conveyed to the *fœtus*.

As in this ſtate the *appendices* are conſiderably large, though not all equally ſo, they may then not only be diſtinguiſhed by the eye; but alſo a probe of ſome ſize may be introduced into them, and paſſed with eaſe, even to the veinous branch from whence they ſpring, in order to aſcertain, by this means, the truth of the facts we have here advanced.

Beſides theſe blood-veſſels there are others, and of another kind, placed in the ſame manner, between the carnous and the internal membranes, and known by the name of *lactiferous veſſels*, on account of the colour, and nature of the humour, they contain; or *vermicular* veſſels, on account of the windings they make. Theſe veſſels are as large as hogs briſtles towards the end of pregnancy, full of white and milky humour, and intwined with each other, and with the blood-veſſels, eſpecially the veins. The length of each of theſe little veſſels, is, for the moſt part, four or five lines. They form a prodigious number of ſmall cells, each conſiſting

sisting of four or five distinct vessels, which terminate together in one common point, where they appear to be a little enlarged, and pass through the internal membrane, to emit the humour which they contain into the cavity of the *uterus*.

III. Besides the adhesion of the *uterus* to the contiguous parts, which we have already mentioned, it is, according to the received opinion, retained in its place by three ligaments, which belong to it. One at the superior part, which they call the *broad ligament*; and two, which rise from its lateral parts, and incline downwards, known under the name of the *round ligaments*.

The *broad ligament* is only an expansion of the *peritonæum*; which lines the cavity of the *abdomen*, or lower belly, and all the *viscera* that are contained in it. This ligament, therefore, is nothing but a portion of the *peritonæum*; which, having covered externally a part of the *fundus* of the *uterus*, extends to the bones of the *ilium* on the right and left; and to the *vertebræ* of the loins. In fact, this pretended ligament does not hold the *uterus*. It is naturally very lax, and stretches easily in the *descensus* of the *uterus*, whether in the simple or reversing kinds of it. The only use, that can be attributed to this ligament, is to sustain the testicles or *ovaria* of the women.

The *round ligaments* seem to merit a little better their name. They rise from the two sides of the *uterus*, nearly about the height of the *ovaria*; then, descending towards the groin, pass through the rings of the muscles of the *abdomen*; and, expanding themselves as they proceed, terminate in the groins. The use is given to them, of holding the *uterus* streight, by preventing its inclining to the right or left; and they might, in fact, produce this effect, when the *uterus* is empty: because they are then affixed pretty near to its *fundus*. But this use is at that time needless: for the *uterus* being then inclosed

ed in the baſon, cannot incline to either ſide. This uſe, therefore, could be of any conſequence, only in the time of pregnancy: when the *uterus*, emerging much above the baſon, requires to be kept in a ſtreight poſition; which renders the delivery much leſs difficult. But, at that time, theſe ligaments cannot perform this office: becauſe the *uterus* enlarging only in its *fundus*, and inlarging there very much, the round ligaments can only hold it by its neck; which leaves all the body of it entirely looſe and moveable.

It has been ſometimes thought, that theſe ligaments were tendinous: but a more attentive examination; and, in a more ſatisfactory manner, injections; have ſhewn, that they were formed of a great number of blood-veſſels, both arteries and veins, twiſted together in a thouſand different ways; and covered by a kind of coat, which is thought to be a production of the external membrane of the *uterus*. It is ſuſpected, nevertheleſs, with reaſon, that there are, under this coat, ſome longitudinal muſcular fibres, which give theſe ligaments the power of ſhortening themſelves, either both together, or ſeparately. If this ſuppoſition be allowed, theſe ligaments may ſerve to draw the *uterus* into the *vagina*, and to make it approach the *vulva*; in order that it may, on certain occaſions, receive more immediately the ſeminal fluid into its orifice, at that time open; which would aſſiſt conception. But this aid is not always neceſſary; and perhaps never abſolutely ſo.

## § II. *Of the teſticles, or* ovaria *of women; and of the Fallopian tubes.*

The parts, of which we are going to treat in this article, do not properly belong to the body of the *uterus*; but they have ſuch relation to it, and are of ſuch important uſe in generation, that it is neceſſary

ceſſary to give the moſt particular deſcription of them.

The teſticles of women, which are called at preſent the *ovaria*, are two bodies, of an oval form, but a little flattiſh; ſmaller, and ſofter than the teſticles of men. They are placed at the ſide of the *uterus*, to the right and the left, almoſt on a level with its *fundus*, on the broad ligament, which embraces them; and, by a cord that it forms, of the length of an inch, or an inch and half, faſtens them to the body of the *uterus*. They are connected alſo by a corner below, to the ſide of the *corpus fimbriatum* of the *Fallopian* tubes, which is nearly under them; excepting that, they float in the *abdomen* with the broad ligament.

The diſtribution, in theſe parts, of the blood veſſels, which are ſtill called ſpermatic, has conduced to ſupport the opinion of the antients, who conſidered them as true teſticles, on account of its being the ſame as in the teſticles of men. Each *ovarium* has one artery; which ariſes from the trunk of the *aorta deſcendens*, under the emulgent arteries, and carries the blood into the ſubſtance of the *ovarium*. This blood is retaken up, on each ſide, by a vein; which, on the left, paſſes forwards, to join the emulgent vein of the ſame ſide; and, on the right, to the trunk of the *cava*, under the emulgent vein; intirely the ſame as in men. The *ovaria* have nerves, that come from the intercoſtal; and lymphatics, which depoſit their lymph in the lymphatic glands, that are placed along the trunk of the *aorta*; from whence it paſſes into the glands of the meſentery; and thence into the *receptaculum* of Pecquet.

The coat, which covers the *ovaria*, is ſmooth and denſe, very like the *peritonæum*; and there is ſome reaſon to account it a production of the broad ligament, which is itſelf an expanſion of the *peritonæum*. When the *ovaria* are ſtript of this coat, it is found, that they are formed of two different and unequal ſubſtances;

ſubſtances; the upper of which takes up two thirds of their thickneſs. It is yellowiſh, and appears purely of a ſpongy texture, and beſpread with ſeveral tendinous fibres; betwixt which, Mr. Litre believed, he perceived muſcular fibres, in an *ovarium*, wherein the volume was much enlarged by an abſceſs that was formed in it*.

The ſtructure of the inferior part of the *ovaria* which is white, is compoſed of a great number of *cellulæ*, ſeparated by membranous partitions. Theſe *cellulæ* contain each a little bladder, full of glutinous lymph, that grows hard by heat, in the ſame manner as the white of an egg; and they adhere to their reſpective *cellulæ*; but appear to be looſened gradually, in proportion as they inlarge, and become diſconnected when they are *fecundated*. I ſay *fecundated*; becauſe, as ſoon as the ſtructure of the teſticles of women were known, and the reality of theſe *veſiculæ* was aſcertained, they were regarded as the germs of *embryoes*, and compared to the eggs of birds; from which, in fact, they differ only in their ſmallneſs, and the want of a ſhell to cover them. The name of *ova* was however quickly given them; and it was eſtabliſhed as a certain fact, that *omne animal ab ovo:* whence it became cuſtomary to call *ovaria*, what till that time had been called *teſticles*; this is the only name under which theſe parts are at preſent known.

Theſe facts were very novel, and very important; nor is it without reaſon the belief of them has been adopted. Harvey had obſerved in the deer, which the king of England had granted him, to be diſſected at different times of their being with kid, that there always appeared, in their *ovaria*, as many reddiſh cavities as there were embryoes in the *uterus*. Theſe were called *cicatriculæ*; and it was evident, that *ova* had been detached from them. Grant repeated and verified the ſame facts with re-

* See Mémoires de l'Académie, 1701. p. 100.

ſpect

ſpect to rabbits; of which he ſacrificed a great number to his curioſity.

Theſe facts muſt be granted to be very concluſive, to prove that theſe veſſels or *ova*, which are ſeparated from the *ovaria*, are really germs of embryoes, which are found in the *uterus*. But there are, nevertheleſs, proofs yet more certain. Embryoes have been obſerved in *ova*, which have fallen into the cavity of the *abdomen*; and they have been moreover often found in the *Fallopian* tubes; where they have continued to grow even to the eighth or ninth month. They have been alſo found in the *ovaria* themſelves, when they could not gain a paſſage from their cells; but have grown there; and afforded poſitive marks of the preſence of an *embryo*. After conſidering theſe facts, of which we ſhall ſee the conſequences below; it is impoſſible to doubt that the *ova*, found in the *ovaria*, are not actual germs; and this ſhould excite our attention to examine more accurately all the particulars reſpecting them.

The *ova* are very numerous in each *ovarium*; and are all of a ſpherical form: but they are, nevertheleſs, of different ſizes. There are ſome as ſmall as a grain of millet; and others as big as a large pea; and a line and a half, or even two lines in diameter. It has been obſerved, that, in the *ovaria* of young girls, the *ova* are very ſmall, and difficult to be perceived; that they are bigger in marriageable women, and may then be conſidered as arrived to a mature ſtate, and fit to be impregnated; and that, in women, who have ceaſed to have their *menſes*, and have attained to the fiftieth year of their age, they are ſhriveled, diminiſhed, and uſeleſs for generation.

It is not to the preſent purpoſe to enquire, how the fecundation of the *ova* is brought about; but it is certain, that, in order to be capable of impregnation, they muſt have acquired a certain magnitude

tude or maturity; that, as ſoon as they are impregnated, they grow larger very faſt, and more in proportion than the neighbouring parts; and that, in their growing bigger, they dilate their cells, forcing them outwards, and rendering thinner the portion of the common coat which covers them. It is generally thought, that, in conſequence of ſtretching this coat, they tear it; and make themſelves a paſſage through the rent part. But it does not ſeem feaſible, that God has left an operation of ſo much importance, and on which the generation of animals depends, to the uncertainty of a ſolution of continuity. It is more natural to conjecture, that there is, to each cell, an imperceptible * ſlit, which dilates itſelf, and opens to give paſſage to the *ovum*, when the coat has been ſufficiently ſtretched, and rendered thin enough. This conjecture may be ſupported by the inſtance of the *ovarium* of fowls, and all other birds; where a ſlit, deſigned for the paſſage of the eggs into the *oviductus*, may be ſeen.

The cavity left by the *ovum* in the *ovarium*, when it is ſeparated from it, has been alſo obſerved. It is ſpherical as an egg; and is two lines in diameter. There is found, at the bottom of it, a yellowiſh body (*corpus* † *luteum*), ſometimes a little bloody; which makes a kind of cup to hold the *ovum*, as the cups of acorn hold them. It is probable that this connection is made by the *placenta* of the *ovum*, or, rather, by that which is to be a *placenta*; and by one ſimple adheſion, in ſuch a manner that the ſe-

* Mr. du Verney, the younger, aſſures us, he has obſerved in the *ovaria* of cows, that they are perforated with a ſlit in a croſs direction, cloſed very exactly with the ſame membrane; of which one edge goes over the other, in the form of a fiſh's ſcale. *Memoires de l'Academie des Sciences. Ann.* 1701, p. 292.

† *Memoires de l'Academie des Sciences, ann.* 1701. The Obſervation is by Mr. Litre.

The ſame perſon confirms this in the hiſtory of the Academy, *ann.* 1706, p. 26.

paration

paration may be effected without laceration; as leaves of trees fall off in the beginning of winter. It has been obſerved, that this ſubſtance may be divided into two *lamina*; the interior, which is glandulous, and of a yellow colour; and the exterior, which is red, and of a muſcular texture.

The delicacy of the formation, and the uſe to which the *ovaria* are appropriated, ſubject them to many diſeaſes, of which we have ſpoken above, *Books II, Chap. XII.* as hydatids, dropſies, ſchirruſes, or ſchirrous tumours, abſceſſes, and ſteatomatous humours. The change of condition, which theſe diſorders produce in the *ovaria*, has often deceived anatomiſts; and made them miſtake the true ſtructure of theſe parts. But the matter is better underſtood at preſent; and it is well known, how to diſtinguiſh the preternatural changes from the true conformation of the *ovaria*.

II. The *Fallopian* tubes are two crooked ducts, placed at the two ſides of the *uterus*; and under the *ovaria*; the one on the right, and the other on the left; of the length of three or four inches, and of a moderate thickneſs; leſs at the lower end, which opens into the cavity of the *uterus*, and bigger at the ſide of the *ovaria*; where they ſpread; and are cut into jags or fringes; which has occaſioned their being called *corpora fimbriata*.

Theſe ducts have been known for a long time *: but an uſe, to which they have no claim, was aſcribed to them; and they were called by a name to which they had no right.

As a ſeminal fluid was thought to be ſecreted in the teſticles of women, as in thoſe of men, it was concluded, that theſe ducts were deſigned to carry it into the *uterus*; and in conſequence of this wrong notion, they were called the *vaſa deferentia*. But

* Rufus of Epheſus, an antient phyſician, has deſcribed them accurately. *De Corp. Human. Part. Appellatione*, lib. i. chap. xxv.

Harvey

Harvey having remarked, that the teſticles of women contained only *veſiculæ*, in which were the germs of the *fœtus*, that are found in the *uterus*, comprehended ſoon, that the *veſiculæ* muſt deſcend by theſe paſſages; or to ſpeak more properly, he was convinced of it by the evidence of his ſight, in the inſtance of does, which the king of England permitted him to open after conception. Thus, when he changed the name of the teſticles of women, which he called *ovaria*, he changed alſo the name of the pretended *vaſa deferentia*, and called them *oviductus* (the paſſage for the eggs) and more commonly *tubæ*, becauſe of the reſemblance they bear to trumpets, by having their cavity, which is narrow on the ſide of the *uterus*, grow wide on the ſide of the *ovaria*. It is in conſequence of this denomination, that the French call the extremities of theſe ducts, which expand on the ſide of the *ovaria*, *pavillions*, from the ſame name having been given to the large end of trumpets: but the Engliſh call them *corpus fimbriatum*, or devil's bit, from their jagged termination.

Theſe *tubæ*, or to follow the common uſage eſtabliſhed in honour of him, who firſt knew their true function, theſe *tubæ Fallopianæ*, are ſupported by the broad ligament of the *uterus*, which ſerves them for a meſentery; and affixed by one ſide of their *corpus fimbriatum*, to the corner of the inferior part of the *ovaria*, nearly at the ſide of the *uterus*. Excepting this, their extremity, on the ſide of the *ovaria*, is looſe, and capable of different ſituations; as is ſeen in opening of dead bodies.

Three coats are obſerved in theſe ducts: the *exterior*, which is membranous, and a production of the *peritonæum*; or what comes to the ſame thing, of the broad ligament: the *middle*, which is muſcular, and in which may be diſtinguiſhed, by means of a microſcope, longitudinal and circular fibres, when theſe ducts have been macerated in vinegar, after

after being ſtript of their exterior coat: and the *interior*, which adheres much to the interior coat of the *uterus:* as may be ſeen by the facility with which fœtuſes are nouriſhed, and grow there, in the conceptions formed in the *tubæ*.

The *Fallopian* tubes are liable to many diſorders: as has been ſhewn in *Book II. Chap. XII. Art. II.* The extremity, at which they open into the *uterus*, has been ſometimes found intirely cloſed; and ſometimes their upper extremity on the ſide of the *ovaria*, has been contracted and ſhut up. At other times ſtrangulations have been obſerved on the intermediate part, which intirely deſtroy their paſſage: and the compilers of obſervations have remarked, that the tubes are ſubject to incyſted dropſies, abſceſſes, polypuſſes, ſteatomas, or atheromas. I am well aſſured, that theſe ſingular caſes muſt have embarraſſed the firſt obſervators; and ſuggeſted much doubt to them, with relation to the reality of the functions attributed to the *tubæ*; but, as it has been already ſaid, with reſpect to the *ovaria*, a long time has elapſed ſince theſe doubts have been diſpelled; and the obſervators have known, how to diſtinguiſh the natural ſtate of the *Fallopian* tubes, which renders them fit to perform their office, from the præter-natural diſordered ſtate, which makes them incapable of it.

CHAP.

# CHAP. II.

## *Of the coverings of the* fœtus; *and of the after-birth.*

AS ſoon as the *fœtus* is in the womb of its mother, it is incloſed in a kind of bag, formed by two membranes, the *chorion*, and the *amnion*. To the firſt of theſe membranes, is fixed a circular body, moderately thick; ſtrongly adhering to the *uterus* in pregnancy, and retaining in its place all the after-birth, known by the name of the *placenta*. The *fœtus* is conjoined with this *placenta*, by a cord, which comes out from the navel; and is called, for that reaſon, *funis umbilicalis*, or the navel-ſtring. Theſe ſeveral parts bear, in Latin, the name of *ſecundinæ*; becauſe, they commonly come away after the child: and, for the ſame reaſon, they are called, in French, *l'arriere-faix*, or, *le delivre*; and, in Engliſh, *after-birth*, or *ſecundine*. Though they do not ſerve immediately to generation, yet they ſerve to the preſervation and nouriſhment of the *fœtus*; on which account it is neceſſary to deſcribe their ſtructure and uſes.

### § I. *Of the* chorion *and the* amnion.

I. The *chorion*, the moſt external of the coverings which incloſe the *fœtus*, is a denſe membrane, thick, uneven on the interior ſurface, which is next the *uterus*; where it is beſet with little round bodies, red and pulpous, entirely like the ſubſtance of the *placenta*, which we are going to ſpeak of; but ſmooth and even on the other ſurface, on the ſide of the *amnion*, againſt which it lies, without being united with it; being ſeparated from it by a little mucilaginous lymph, with which it is ſpread over.

The other covering, or the *amnion*, is thinner, and more tranſparent. It is ſmooth on the ſide of the *chorion*, againſt which it lies, without ſticking to it. On the other ſide, it is ſmooth in the ſame manner; and ſpread over with a glutinous humour. There may be diſtinguiſhed, in the *chorion*, many ramifications of arteries and veins; but fewer are found in the *amnion*, though it is not wholly deſtitute of them. Theſe two coverings form a pretty large cavity, which eaſily holds the body of the *fœtus*, even to the ninth month; and leaves it even then at liberty to move itſelf. Beſides the *fœtus*, this cavity contains a conſiderable quantity of lymphous *ſerum*; of which we ſhall below explain the nature, production, and uſe, in ſpeaking of the *umbilical* cord of the *fœtus*.

There is found in the after-birth of brutes, a third membrane, which does not merit the name of a covering; becauſe it does not cover the *fœtus*. It is a kind of membranous bag, pretty long, and reſembles a great pudding; which has procured it, in the Greek language, the name of *allantoides*; and, in the Latin, *farciminalis*. It is placed betwixt the *chorion* and the *amnion*; and is very eaſily diſtinguiſhed: becauſe, it is the reſervoir of the urine; which, in brutes, flows in by drops from the bladder of the *fœtus*, by a duct called *ouracus*.

But this membrane is not found in the after-birth of the human *fœtus*. Endeavours have been vainly made to diſtinguiſh it there; and ſome have erroneouſly flattered themſelves with a notion of ſucceſs, owing to their taking for it, one of the *lamina* of the *chorion*, which they had ſeparated; though there is not the leaſt reſemblance betwixt them.

§ II.

## § II. *Of the* placenta.

There is, as has been ſaid, on the exterior ſurface of the *chorion*, a pulpous body, ſpungy, reddiſh; of ſeventeen or eighteen inches diameter; and an inch, or an inch and half thick: and its centre, though thinner by one half, at its circumference, ſtrongly adhering to the *chorion*, with which it agrees in its figure; being convex, like it, on the ſide next the *uterus*, to which it adheres, during the time of pregnancy, and concave on the ſide next the *fœtus*. This body is called, in Latin, *placenta*; becauſe it pretty much reſembles a cake, by its figure and its thickneſs: and this name is adopted in French, and Engliſh.

It may be eaſily conceived, that the *placenta* is covered, on the ſide next the *fœtus*, by the *chorion*; againſt which it lies: and even by the *amnion*, but lies itſelf againſt the *chorion*; which conſequently ſtands to it, in the place of a double coat. But it is diſputed, whether, or no, it has any coat on the ſide next the *uterus*. Some anatomiſts have given it one: and Ruyſch, among others, pretends, that this coat is one of the *lamina* of the *chorion*: and that it is cloſe, and denſe. But there is great reaſon to believe, that theſe anatomiſts are deceived. For the juices, or humours intended to nouriſh the *fœtus*, muſt enter into the *placenta*, in order to reach the *fœtus*: and this coat would hinder thoſe humours to penetrate thither. It muſt be allowed then, that, on this ſide, the *placenta* is without coat: as Mr. Mery * has proved it: or, that if it have any, it is a very thin one, formed by ſome membranous fibres, interwoven in form of net-work, through the maſhes of which all the juices may eaſily find a paſſage: and Mr. Mery has reduced the matter to this, after the moſt aſſiduous examination.

* Hiſtoire de l'Academie, ann. 1714, p. 12.

The exterior ſurface of the *placenta*, is divided into ſeveral eminences: ſome greater; and others leſs: among which are furrows of different depths. There are found, on each of theſe eminences, one, two, or ſometimes three circular holes; ſome bigger, and others leſs: which go into the ſubſtance of the *placenta* three or four lines. In proportion as the *fœtus* begins to grow large, the eminences and furrows, belonging to the *placenta*, impreſs themſelves on the pulpous ſubſtance of the *uterus*, in the place where they are contiguous in pregnancy, as a ſeal on wax; that is to ſay, the prominences of the *placenta* make beds for themſelves, in the ſubſtance of the *uterus*, and the furrows of the *placenta* receive, in their turn, the ſubſtance of the *uterus*, which inſinuates itſelf there. This mutual introreception of the prominences of the *uterus*, and the *placenta*, makes the firſt adheſion of the *fœtus* with the *uterus* of its mother.

But ſtronger adheſions become neceſſary, to ſuſtain the *fœtus*, when it is grown bigger. Then the veins and *cœcal appendices*, before ſpoken of, elongate, and dilate themſelves in the place where the *placenta* is faſtened; paſs into it; form fit hollows for themſelves; and make thoſe circular holes which are found there. Theſe inſertions of veins, multiplied to a great number, form the laſt adheſions of the *placenta* with the *uterus:* which, added to the firſt, are ſufficient to ſupport the after-birth, and the child that is contained in it, during the whole time of pregnancy.

Enough has been here ſaid on the figure, coats, and adheſions of the *placenta:* it remains now to deſcribe the ſubſtance, which compoſes it. To do that, in a clear manner, the *placenta* muſt be parted into two layers, or *lamina*, the one on the ſide next the *chorion*; the other on that next the *uterus*. The firſt is compoſed of a great number of trunks of arteries, and a yet greater number of trunks of larger

larger veins, interwoven with each other. These arteries, and veins, are distributions of the umbilical vessels, before spoken of; which, after being both parted into several branches, terminate in an infinity of capillary ramifications; and spread, not only throughout the whole extent of the *placenta*; but even over all the exterior surface of the *chorion*: particularly over the little round bodies, or knots, of which we have spoken before; and which serve the purpose of little *placenta*. Some ramifications, moreover, of these veins, though only very small ones, are carried even to the *amnion*.

As to the other of these two *lamina* of the *placenta*, it is supposed to be formed, at the depth of an inch, or an inch and half, of several membranous cells, or *vesiculæ*. The facility with which this portion of the *placenta* may be puffed up, by blowing with a pipe into any of the holes with which the eminences of it are perforated, confirm this opinion. It squares very well, moreover, with the known and certain use of the *placenta* itself; which must receive the nutritious juices of the *fœtus*, and transmit them into the ramifications of the umbilical veins. For these cells, or *vesiculæ*, are very properly suited to the being charged with the milky juice, which flows from the *uterus* during the first part of the time of pregnancy; to receive in the same manner afterwards the blood, that the cœcal veins of the *uterus* communicate to them; and to convey these two fluids from *vesiculæ* to *vesicula*, and to some branch of a vein which they inosculate; where they deposit them, to be transmitted to the *fœtus* by the circulation.

I am aware, that Ruysch has pretended, the *placenta* is purely vascular; and that he always treated of it on that footing. But I am much afraid the preparation he made of the *placenta*, has misled him into that error. He injected first all the blood-vessels of the *placenta*; and filled them with

wax, even to their capillary branches. He let it afterwards be macerated in a fluid, which ſoftened, and putrified all its ſubſtance, in ſuch manner, that there remained nothing more than a ſkein of blood-veſſels, full of wax, that had reſiſted the action of the fluid: and it was that, as he believed, which conſtituted the true conformation of the *placenta*. It is much to be doubted, nevertheleſs, whether ſuch a preparation, practiſed on almoſt any of the *viſcera*, would not have cauſed the ſame illuſion in this celebrated anatomiſt, on the examination of their ſtructure.

On injecting warm water into the veſſels of the *placenta*, there is ſeen to appear, on the exterior ſurface, a great number of lymphatic veſſels, of which I could never trace the diſtribution; at leaſt in the umbilical cord, whatever pains I might take to do it.

## § III. *Of the* umbilical cord; *and the waters of the after-birth.*

The parts of which we have already treated, are thoſe which ſerve to the preſervation of the *fœtus*. But, in order to that effect, it is neceſſary, that it be conjoined to them, which is brought about by the *umbilical* cord, that unites them. It is neceſſary, therefore, to deſcribe this cord; and to note the uſes of it.

This cord is affixed, at one end, to the navel of the *fœtus*: which has given it the name of the *umbilical* cord: and, at the other end, to the *placenta*; where it terminates generally toward the centre; but ſometimes nearer the circumference. The thickneſs of the *umbilical* cord varies very much: ſometimes it is large, and full of knots; and, at other times, it is leſs, more even, and equal. Its length varies in the ſame manner; for ſometimes it is long enough to leave the *fœtus* at the intire liberty

liberty of its motions: and at others, it confines it by its ſhortneſs; or embarraſſes it by its length. To conclude, this cord, however, ſtrongly attached to the navel at the *fœtus*, appears to be ſeparated by a margin, that merits to be examined. The coat, which covers this cord, is hard, firm, and ſpread over with a glutinous humour; and formed of a production of the *chorion* and *amnion*. When it is opened lengthways, it may be found, that three blood-veſſels are incloſed in it; that is to ſay, two arteries and one vein: which, in ſome ſubjects, keep, with reſpect to each other, a parrallel direction; and then the cord is moderately large, and of an equal thickneſs throughout: but, in others, they are entangled together, in various manners; which thickens the cord much, and produces thoſe knots, that are ſometimes ſeen in it. There are found, among theſe veſſels, for the whole length of the cord, a kind of tranſparent mucilaginous *gluten*; which will melt on being handled. It is ſometimes in ſmall quantities; and then the cord is ſmall: but at other times, it is more copious; and then the cord is large. Sometimes it is crowded with little round bodies, which is another cauſe of its knots. In the after-births of brute animals, where there is an *allantoides*, there comes out of the bladder a duct, called *ouracus*, incloſed in the cord. But the *ouracus* does not go farther than the navel in the human *fœtus*; and is loſt there, without being capable of being diſtinguiſhed in the length of the cord. The two umbilical arteries carry the blood of the *fœtus* into the *placenta*. They riſe on the right and the left, from the two internal iliac arteries; paſs to the two ſides of the bladder; come out at the navel; and, without dividing ſo long as they are in the cord, go on to terminate in the *placenta*; where they form, at firſt, ſeveral large branches; which, ſubdividing, ſucceſſively make, as has been ſaid above,

an infinite number of capillary arteries; diſperſed over the *placenta*, *chorion*, and the *amnion*.

As to the umbilical vein, intended to convey back the blood of the *placenta*, to carry it to the *fœtus*, it is formed by the ſucceſſive re-union of an infinite number of capillary veins; which have received the blood of the arteries; and, when it comes to the navel, it riſes towards the liver, pierces the trunk of the *vena porta*; and the blood, which it contains, preſerving its direction, enters the venal canal; which immediately carries it into the *vena cava aſcendens*. Whence it appears, that the blood of the *fœtus* circulates in its after-birth, as it does in its own members. It is obſerved, that the cavity of the umbilical vein is greater than that of the two umbilical arteries taken together. This difference is diſcovered in the compariſon of all the veins with the arteries. As the motion of the blood in the arteries is more rapid than it is in the veins, it is requiſite, in order to preſerve the uniformity of the circulation, that the cavities of the veins ſhould be larger than thoſe of the correſpondent arteries. But beſides this reaſon, which is common to all the veins, there is one peculiar to the caſe of the umbilical vein; which is, that beſides the blood carried by the umbilical arteries, it muſt convey back the milk and blood, ſupplied by the mother for the nouriſhment of the *fœtus*: which requires an increaſe of the bore.

There remains one very ſingular fact to be explained; which is, that the cavity formed by the *chorion* and *amnion*, is full of a lymphous *ſerum*, in which the *fœtus* ſwims, in ſuch a manner, that during pregnancy, it lives as a fiſh, without reſpiration. This *ſerum* is a true lymph, in the beginning of pregnancy; as may be diſtinguiſhed by taſting it in an after-birth of three months old. Afterwards it becomes every day leſs ſweet, more ſaline; and even urinous. For there is great appearance, that the human

human *fœtus*, not having the advantage of an *allantoides*, makes its urine into the cavity of the *amnion*; at leaſt, unleſs it may be ſuppoſed, that it retains the urine, in its bladder during the whole time of pregnancy: which is not a very reaſonable conjecture.

It is commonly ſaid, that the *ſerum* abounds more in the *amnion*, in the beginning of pregnancy, than at the end: and the fact is juſtly aſſerted; provided it be meant *relatively* to the magnitude of the *embryo*. For, at the beginning of pregnancy, there is ten or twelve times more of this *ſerum* than would counterbalance the ſize of the *embryo*: whereas, at the end, the volume of the waters is ſcarcely equal to twice the volume of the *fœtus*. But it is an error, to ſay, there is more water, *abſolutely* ſpeaking, at the beginning of pregnancy than at the end: for it is certain, that there is generally in the after-birth of a delivery which is at the due period, ten times more water than in a miſcarriage of three months; and a hundred times as much as in one of the firſt month.

The origin of the waters of the *amnion* is not well known: and as a proof of it, different ſources are aſſigned. It is conjectured, they come from ſome ſuppoſed glands, that are placed along the umbilical cord, eſpecially about the place where it is affixed to the *placenta*: but theſe glands are only imaginary, and nobody hitherto has had the good luck to ſhew them. It is ſuppoſed, that the lymphous humour, which tranſudes from the body of the *embryo*, principally at the beginning of pregnancy, furniſhes it: or, at leaſt, contributes to augment it. But allowing this tranſudation to be admitted, the humour, that could tranſude from a child not bigger than a bean, would be a very ſmall reſource. There is more room to ſay, that the urine of the *fœtus* ſupplies a part of this humour; becauſe the fact is certain: but it does not

ſupply

ſupply the whole. Theſe waters exiſt in the *amnion* before the *fœtus* voided any urine. Theſe waters, moreover, are found in the after-birth of brute animals; although there be not a drop of urine: for, in them, it all runs into the *allantoides*, by the *urachus*. In this dubious matter, my opinion would be, if I had the courage to form one, that the lymphatic veſſels, which are found in the *placenta*, as has been ſaid, and of which the progreſs is not to be obſerved in the cord, ſupply it to the *amnion*. This is in fact only a conjecture; but is nevertheleſs a very plauſible one.

The uſes of the waters of the after-birth are better underſtood: they ſerve to maintain the ſoftneſs of the body of the *fœtus:* which contributes to facilitate its growth. Without this proviſion, the *embryo*, for the moſt part, would be dry and horny in the *uterus* of its mother. Secondly, they prevent the contractions of the *uterus*, cauſed in the courſe of pregnancy, by different circumſtances: and the blows which it may reeeive, from galling, or cruſhing the tender and almoſt mucilaginous body of the *embryo:* which muſt otherwiſe happen, if it was immediately expoſed to ſuch contraction or blows. Thirdly, theſe waters, by keeping the *fœtus* in a due equilibrium, promote the means of its extending and unfolding its limbs; and even of moving itſelf: which it could never have the power to do, if it were dry in the *uterus*.

CHAP.

# CHAP. III.

## *Of conception.*

THERE is nothing more wonderful in nature, than the production by generation, when a male and female form a third individual of the ſame *ſpecies*, of which the conformation is like to their own; and this, by a mechaniſm, of which they are ignorant, as well as of the admirable organization of the new individual, which they thus produce.

### § I. *Opinions of the antients on generation.*

As in perfect animals, the junction of the two ſexes is abſolutely neceſſary for generation, it is very evident, that they both contribute to it: and this, in ſome degree, equally. To this reaſon, it is owing, that the countenance of both the father, and mother, are found blended together in their children. To the ſame account, muſt be aſcribed, that, in the monſtrous couplings of two animals of different kinds, the third, which comes from them, carries ſenſible marks of reſemblance to both. But the moſt evident inſtance of the part the two ſexes jointly have in generation, is that, which the commerce of a negro with a white woman affords. There comes at firſt a mulatto child; which is leſs black than his father; and has thinner lips, a leſs flat and broad noſe, and hair leſs woolly and curled. From the commerce of this mulatto with a white woman, there is born an infant more white, leſs woolly, and with thinner lips: but which can yet be diſtinguiſhed from a true white. This the French call a *terceron*. And it is not before the fourth generation, that is to ſay, in the child of a *terceron*, and a white woman, called by the French *quarteron*, that the difference diſappears intirely.

The

The ſame changes are obſerved, in the ſame order, when a negro woman has commerce with a white man, and their children match ſucceſſively with white men, to the fourth generation.

A tranſition may, therefore, be made by either of theſe means; that is to ſay, either by the marriage of the black men with white women, or of black women with white men, in four generations, from the ſtate of negro, to that of a perfect white: or, by the contrary means, from that of a white to that of a perfect negro, by coupling white men with negro women; or negro women with white men; repeating the ſame, with reſpect to their children, three times ſucceſſively: which proves, that both ſexes have a part in the formation of their children, and that nearly in an equal degree.

The greateſt part of theſe facts were known to the ancients: and they concluded thence, that the production of children came from the mingling together the two ſeminal humours, furniſhed by the two ſexes: that theſe fluids, united intimately together in the bottom of the *uterus*, conjoined themſelves with a portion of menſtrual blood: and that this mixture, efferveſcing with heat, and animated by its own peculiar virtue, formed gradually the body of the *fœtus*. Whence came the diſtinction, at that time received, of the parts of the body, into *red* or *bloody parts*, formed of the menſtrual blood; and into *white or ſeminal parts*, formed of the ſeed of the two ſexes.

The idea which the antients had of the formation of males and females, being in conſequence of this opinion, according to them, a male was always formed, when the ſeed of the male was moſt copious, or moſt active; and the contrary, when that of the female exceeded in quantity or power.

But this opinion, whatever long courſe it may have run, ſhould be rejected as indefenſible.

First, Because that, by admitting it, there must be a presumption of the mixture of two fluids; and the motion communicated to their parts, may form, or rather do form, continually, bodies so composed, as those of animals; of which the organization is so wonderful, and of which all the parts have a relation to each other so constant and regular. This is, in a less degree, the same absurdity, as that for which the Epicureans are reproached; the having believed, that the universe was formed by the fortuitous concourse of atoms agitated in void space.

Secondly, Because that this explanation is absolutely destroyed by the discoveries of the moderns; who have succeeded in procuring us some light into this subject, in the midst of all the thick darkness which surrounds it.

## § II. *New discoveries on this subject: which give rise to three opinions on generation.*

On one hand, it has been * found with regard to women, as has been already laid down in a minute detail, in chapter the first, sect. II. that their testicles, inclosed in the inferior part, a great number of cells, or of little distinct partitions, each filled with a small round *vesiculæ*, or bladder; all which resemble each other; but are of unequal size: that, in females, at the age fit for generation, some of these *vesiculæ* have attained a suitable magnitude to be impregnated, by the seminal fluid of the males:

* William Harvey, *Exercitationes de Generatione Animalium*, London, 1651.

John Van Horne, in *Epistola de Genitalibus ad Guarnerum Rolfinctum*, 1668.

Theodorus Kerkringus, *Anthropogeniæ Ichnographia*. Amstelodami, 1670.

Nicholas Stenon, *Elementorum Myologiæ specimen, cui accedit—— dissectus piscis ex canum genere*. Amstel. 1669.

John Swammerdam, *Miraculum Naturæ, sive uteri muliebris fabrica*. Lugduni Batavorum, 1672.

that

that thoſe, which had been impregnated, ſeparated from their cells; deſcended into the *uterus*, by the Fallopian tubes; and formed as many diſtinct *embryoes*: which was proved by this, that the number of *embryoes* always correſponded with the number of the cells of the *ovaria* that were empty; and whence the *veſiculæ* had paſſed out.

In conſequence of theſe facts well eſtabliſhed, it has been thought juſt, to conclude theſe *veſiculæ* to be ſo many *ova*, or little eggs. Therefore, to ſpeak accurately, all the difference betwixt the *oviparous* animals, which lay eggs, and the animals which bring forth their young alive, and are called *vivaparous*, is, that the firſt are delivered of their eggs, as they fall into the *oviductus*; which in them ſupplies the place of an *uterus*; and ſit on them afterwards till they be hatched: whereas the others retain them in their *uterus*, and ſit on them there till ſuch time as they are in a condition to be hatched in the delivery.

On the other hand, it is found *, with reſpect to males, firſt, That of whatever kind they are, as ſoon as they are fit for generation, they have, in their *ſemen*, a very great number of ſmall animals, like little worms, very lively, and very active, peculiar to this particular humour; and which are not ſeen to be in the blood, or any other humour of the body.

Secondly, That theſe animals, or kind of worms, do not appear in the males, while too young, or do appear in a ſtate almoſt void of motion: that they begin to appear there, and to move about, in proportion as the males approach the age when they are fit to engender: that they are very numerous and active at this age; and that they diſappear, or

* Leewenhoek and Hartſoeker have diſputed this diſcovery: but we ſhall ſee below, that it had been made before either of them.

become

become very languid in old men, in proportion as they advance in age.

Thirdly, That these worms are always of the same form, and figure, in the *semen* of animals of the same kind; and differ only in being a little bigger or less.

Fourthly, That these worms are of a different form and figure, in the *semen* of animals of different kinds.

Fifthly, That these worms are not to be distinguished without a microscope, because of their extreme smallness. But we may refer, as to this, to Leewenhoek *; who must be allowed to be one of the best observers of these *animaculæ*, though neither the first nor the only one.

Sixthly, That, to conclude, these worms are more or less numerous, and more or less active in the *semen*, according as the kinds of animals are more or less fit for generation; or that the individuals of the same species are more or less disposed to venery.

These discoveries have given rise successively to three different opinions on generation.

I. As soon as the existence of the little *vesiculæ*, or *ova* of women was known, it was hastily concluded †,

1° That each of these *ova* was a true germ of a *fœtus*, which was inclosed in the coverings of the after-birth.

2° That the *embryo* was intirely formed, and the whole arranged in this manner by the hand of God, either by being produced there on the general mechanical principles, though in an unknown manner, or organized by particular acts of his will.

3° That, in proportion, as the females advanced in their pregnancy, the *ova* inlarged also: but une-

* *Epistola data ad Homannum Van Zoelen*, Oper. tom. iii. p. 18.

† Regner de Graaf is the first who has fixed the use of eggs: and who maintained this system all his life.

qually,

qually, nevertheleſs, accordingly as they were more or leſs compreſſed in the place which they occupy.

4° That, therefore, if it happened, the moſt ſubtile and ſpirituous parts of the fluid of the male penetrated quite to this *ovum*, attained to its maturity, and conſequently in a ſtate to receive the impreſſions, they there excited a rarefactive motion, or fermentation, which put the *ovum* in a condition to acquire a new growth, proper to unfold the parts of the *fœtus:* and that fecundation conſiſted in this.

5° That the *ovum*, being once thus fecundated, grew very faſt; became very ſoon large; broke from its cell; fell into the *corpus fimbriatum* of the Fallopian tube of the ſame ſide; decended, by the tube into the *uterus*; and there adhered: which completes the whole of conception.

6° That in ſome animals, where there are ſeveral *ova*, which obtain the requiſite magnitude, or maturity, at the ſame time, one ſingle act of copulation will fecundate ſeveral: whereas, in other animals, there is only one or two *ova* fecundated at once: becauſe there were only one or two, which had arrived at the ſame time to due maturity.

II. The diſcovery of the worms in the *ſemen* gave riſe to another opinion; which had but few followers: but which, nevertheleſs, is proper to be diſplayed.

It has been pretended, 1° That each of theſe little worms were the germ of a complete *fœtus*, compoſed of a male or female *embryo*, and its afterbirth.

2° That of the millions of worms, which penetrated into the inſide of the *uterus*, with the fluid in which they ſwam, there were only three or four in ſome animals, or one or two in others, that took any effect: which happened to be thoſe that were the

the ſtrongeſt, and moſt robuſt; or the moſt fortunately placed in the *uterus*.

3° That theſe fortunate worms were affixed, by degrees, to the *uterus:* by means of the *placenta*; which was their exterior covering; and which afforded them their nouriſhment.

4° That they grew gradually, by this means, and attained at laſt the ſize of a compleete *fœtus*; and the ſtate, in which they were proper to come into the world, according to the period fixed to each kind of animal.

III. At length, as the defects of theſe two opinions were perceived, a third was conceived, formed out of both the others.

1° In the conception of each *fœtus*, the female furniſhes an *ovum*; and the male a worm, or little *animalculum*.

2° The action of the moſt ſubtile parts of the *ſemen* of the male, conveyed to the *ovaria*, produces in the *ovum*, or in the *ova*, of one, or both, the *ovaria*, that change called *fecundation*, or *impregnation:* which renders the *ovum* capable of growing; of breaking through its cell; of falling into the Fallopian tube; and, at laſt, of deſcending into the *uterus*.

3° This *ovum*, having got into the *uterus*, finds there a great quantity of ſeminal worms, which have been introduced with the *ſemen*; of which ſome one, in conſequence of its paſſing that way, penetrates at length, by a little opening, an apartment, which was deſigned for it; and ſettles itſelf there.

4° This *ovum*, therefore, provided with a worm, becomes a complete *fœtus*; which is affixed to the *uterus* by the *placenta*; and grows there, till ſuch time as it arrives at the period of delivery.

5° Conſequently, in this opinion, the male and female contribute equally to generation. The male furniſhes the *embryo*; and the female the *nidus*,

where it muſt be placed, to live, and be nouriſhed; that is to ſay, the after-birth, which contains and ſurrounds the *embryo*.

Theſe three opinions divide all the writers. There is none of them, nevertheleſs, ſufficiently certain to deſerve to be adopted blindly.

The firſt gives women the principal, or rather the only part in generation; and, in that, is contradictory to obſervation. Beſides this, it affords no reaſon for the exiſtence of the worms in the *ſemen*. For, to ſay, they ſerve to excite deſire in the males, is, to ſay a thing void of the leaſt reaſon. The exiſtence of ſuch worms in the lymph of the ſtomach muſt be in the ſame way admitted, in order to account for hunger.

The ſecond opinion is weak in the ſame part, as the firſt. It gives too much to the males; and leaves no ſhare of action for the females. It allows no reaſon for the uſe of the *ovaria*; nor the *ova*, which fall from the *ovaria* into the *uterus*.

The third appears more reaſonable: becauſe it aſſigns a part to both males, and females, in generation; and is equally confirmed by obſervations, on the *ova* and the worms. But it has, nevertheleſs, two great defects. The one is, that it cannot be thus explained, in a feaſible manner, how the *ſemen* retained in the *uterus* can fecundate the *ovum*: nor in what this fecundation really conſiſts. The other, that one cannot thus aſſign any cauſe for the conceptions in the *abdomen*, the *ovaria*, or the Fallopian tubes: which are eſtabliſhed, as facts, by indiſputable obſervations.

## § III. *The fourth opinion, which ſeems more certain.*

This *hypotheſis* muſt, therefore, be corrected; and the following is, as I conceive, the way to do it.

Let

Let us ſuppoſe, that it is very conformable to the ſtructure of the parts, that, in the act of conception, the *uterus* approaches the *vulva*, by the contraction of the longitudinal fibres of the *vagina:* and by the ſhortening of the round ligaments; and that, at the ſame time, the orifice opens by the tonic contraction of the radious fibres, which ſurround it, excited by the acuteneſs of the ſenſation. It is evident that, in this doubly advantageous ſituation, the *uterus* would eaſily receive the ſeminal fluid of the male into its cavity. This fluid being conſequently introduced there, theſe circumſtances would cauſe a very ſtrong impreſſion by irritation, which is diſtinguiſhed by the name of *æſtrum venereum*; that would occaſion many concurrent motions. It is, in the ſame manner, that the irritation of a little ſnuff on the pituitary membrane cauſes the ſudden contraction of ſeveral muſcles, which contribute to produce ſneezing.

1° The orifice of the *uterus* cloſes, by the contraction of the circular fibres, which ſurround it: and the *ſemen* being once received, cannot, on that account, flow back again.

2° The radious fibres, which are around the openings of the Fallopian tubes into the *uterus*, contract; and, by their tonic contraction, dilate the openings into the tubes, in the ſame manner, as the muſcles of the *pharynx*, by all contracting at the ſame time, dilate the throat in deglutition.

3° By the conſequences of the ſame irritation, the Fallopian tubes ſhorten and ſtreighten themſelves, by the contraction of the longitudinal fibres: and their *corpora fimbriata* contract; and apply themſelves to the inferior part of the *ovaria*; which their fringed edges, that are true muſcles, embrace ſtraitly.

4° The *uterus* itſelf is ſtrongly conſtringed by the ſimultaneous contraction of all its fleſhy fibres, long, oblique, and circular: and its cavity is, by

that means, much diminiſhed. The women who are attentive, ſuppoſing they can ever be ſo in this moment, perceive the laſt motion; which is generally diſtinguiſhed by a ſlight ſenſe of ſhuddering, or kind of *horripilation.*

5° In this ſtate, the *ſemen*, being compreſt by the *uterus*, which is conſtringed; and having no paſſage through the orifice of the *uterus*, which is cloſed; is obliged to force its entry into the opening of the Fallopian tubes, which are then wide open: and, by this means, it is carried to the *ovaria:* which are bathed with it. This important fact has been obſerved twice by the celebrated Ruyſch*, in lucky circumſtances, of which he knew how to take the advantage; and we may ſay of him with reaſon, *that he catched nature in the fact.* Thus two ſtrokes, as it were, of a piſton carry the ſeminal fluid to the *ovaria* of women: and there is no occaſion to imagine, that the ſubtile part of the *ſemen*, retained in the *uterus*, the *aura ſeminalis*, as it is called, inſinuates itſelf into the Fallopian tubes; and riſes even to the *ovaria:* and yet leſs, that it penetrates into the blood veſſels of the *uterus*; mixes there with the blood, and arrives at laſt in the *ovaria*, by the way of the circulation. One cannot, by ſuch means, which are intirely hypothetical, explain how the ſeminal worms can come to the *ovaria:* and, without them, there can be no conception.

6° As the inferior parts of the *ovaria*, therefore, are bathed with the *ſemen* in the *corpora fimbriata* of the Fallopian tubes, and expoſed to the entrance of the worms, which ſwim there in a prodigious number, ſome one, more active, or more lucky perhaps, after many fruitleſs trials, muſt inſinuate itſelf at laſt, through the nich in the coat of the *ovaria*; and

* *Adverſar. Anatomic.* I. p. 123 and 4. *Theſaur.* vi. N. 21. Regnerus de Graaf, *De Mulier. Organis Generationi Inſervientibus, Artic. ante penultim*; relates, that Fallopius had found *ſemen* in the Fallopian tubes.

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from thence into the *ovum*, which is underneath; and plant itſelf there: and, in this manner, the *ovum* is fecundated.

7° It is probable, that the nich in the coat of the *ovaria*, which covers the largeſt *ovum*, is the moſt open, becauſe it belongs to the moſt dilated cell. The ſame reaſon leads us to preſume, that the opening which muſt be admitted to be in the *ovum*, for the entrance of the worm, is biggeſt in the largeſt *ova*: whence it is to be eaſily concluded, that theſe are the *ova* moſt ready to be fecundated.

8° A certain conſequence of this fecundation is, that the fecundated *ovum* makes a very large growth: but I do not believe, this growth ſhould be attributed to the vivifying ſpirits of the *ſemen*; which, by fermenting, rarifies the humours contained in the *ovum*. I conſider theſe ſuppoſitions, as the effects of a ſportive imagination: and, as to myſelf, I think, that this effect of fecundation comes from vacciliatory motions proper to the worm, that is a living animal: which, communicating themſelves nearer and nearer to the parts of the *ovum*, haſten the courſe of the nutritious lymph; and make it flow thither more copiouſly. In this manner, in the iſlands of the Archipelago, the peaſants *, to make the figs, which are one of their moſt profitable articles of produce, ripen the ſooner, put on the fig-trees, which they cultivate in their gardens, branches of wild fig-trees, of which the fruit is full of inſects: which immediately attack the figs of the garden trees; and haſten their ripening. This operation, which is called *caprification*, may give ſome idea of what paſſes in fermentation.

9° The *ovum*, in conſequence of its growing, dilates more and more the nich in the coat which covers it: and leaving the *capſula* or *cup*, where it adhered, in the bottom of its cell, it gets looſe, and falls into

* Tournefort, *Memoires de l'Academie des Sciences. Ann* 1705, p. 340.

the *corpus fimbriatum* of the Fallopian tube; which is yet affixed to the *ovarium*; and quite in a condition to receive it. I ſuſpect that the expulſion of the *ovum* is as much promoted by the growth of the *corpus luteum*, or yellow body, which is placed at the bottom of the cell, and which, in growing bigger, by the fecundation, drives the *ovum* outwards; as by the contraction of the muſcular fibres, which Malpighi*, and Mr. Litre†, have diſtinguiſhed in the *corpus luteum*; which makes the bottom of the cup of the *ovum*: and even by the fibres of the ſpungy body of the *ovarium*, if there be any ſuch; as Mr. Litre ‡ imagines, he has obſerved.

10° The *ovum*, being received into the *corpus fimbriatum*, deſcends gradually into the *uterus*, pretty ſoftly downwards, by the periſtaltic, or vermicular motion of the Fallopian tubes: which is executed by the ſame kind of motion, as the periſtaltic motion of the inteſtines. By this means, the *ovum* falls at length into the *uterus*: and it is not then a *ſimple conception* only; but a *true pregnancy*: the *ovum* then changing its name; and bearing now that of an *embryo*.

11° According to the obſervation of Graaf || on rabbits, there is, in thoſe animals, who go with young only thirty days, an interval of three days betwixt the copulation, and the deſcent of the fecundated *ovum* into the *uterus*. It is a fact, of the truth of which, he aſſured himſelf by ſacrificing many of theſe animals to his curioſity, at different periods, from the time of copulation. It is obvious, the ſame experiments cannot be made on women;

* See the letter, which he wrote, 1676, to Gaſpar Bartholin; and which Bartholin cites at the end of his treatiſe *De Ovariis Mulierum & Generationis Hiſtoria*.

† Memoires de l'Academie des Sciences, ann. 1701, pag. 292.

‡ Hiſtorie de l'Academie, ann. 1701. p. 41.

|| De Mulierum Organis Generationi Inſervientibus, Artic. ante-penultimo.

men; and, consequently, the length of this interval cannot be determined with relation to them *: but it is evident, that it does not follow the same proportion, with respect to the time of pregnancy, as in the case of the rabbits.

12° While the fecundated *ovum* is coming down into it, there are two necessary changes made in the *uterus* to receive the *embryo*. On one hand, the *uterus*, which remains contracted, presses out from the lactiferous, or vermicular vessels, the juice, that they contain; which is then only a milky lymph, or a thin unfiltered milk, but adapted to the wants of the *embryo:* and which would not agree so well with it, if it was as milky as it becomes afterwards. On the other hand, the cœcal *appendices*, which perforate into the *uterus*, being strongly compress by the contraction of the *uterus*, cannot discharge any blood. Thus, from that time, the *menses* are suppress: which is absolutely necessary for the preservation of the *embryo:* as the menstrual blood might have done harm to it; and have carried it off in the beginning of pregnancy. For which reason, if any women continue to have the *menses* in the beginning of their pregnancy, they must only flow from the *vagina*.

Let us finish the long detail, by a reflection, which the subject itself requires. It is said with truth, that death renders all conditions equal: but it may be said with yet more reason, that their origin ought to humble them. For we are all only poor insects: which, among a thousand millions of the same, have been more active, or more lucky:

* Kerckringius, *Anthrop.* cap. ii. says, that, in the case of a woman, who had had commerce with her husband after the *menses*, and who died suddenly at the period of three days, he found in the *uterus* a fecundated *ovum*. If the fact be true, the *ovum* must descend into the *uterus* more quickly in women than in rabbits.

and have insinuated ourselves into *vesiculæ*, where we have grown; and where God has done us the favour to unite us with spiritual souls; which has raised us to the dignity of men.

## § IV. *Of the signs of conception.*

Women, who are desirous to have children, concern themselves very little about the mechanism of conception, they are going to display. They are inquisitive as to the signs, which may show them, when they have conceived, in cases where it is possible they may be in that condition: and they are in the right. This question is more interesting; but it is not easy to satisfy them in a point so difficult.

Let them, however, examine themselves, as to the three following circumstances. 1° Whether they have perceived, that they have retained the seminal fluid, without suffering it to flow out? 2° Whether they have perceived, in the most affecting part of the action, a certain internal motion, and trembling over almost all the body, that resembles a shuddering, though there has been no cold? 3° Let them observe, if their belly be not less, especially below the navel; and if they be not obliged to have the strings of their petticoats straiter?

If they be very certain of these facts, they have reason to hope they have conceived. The first fact presumes, that the seminal fluid is employed to the purpose: the second, that the action of the contraction, necessary to conception, was exerted: the third, that the *uterus* is constringed, and lessened, as it should be in conception.

But where are those women capable of being certain of these facts, particularly the second? I have inquired of several, and I have found only one, or two,

two, who could assure me, that they have distinguished that particular sensation, which happens in conception: and that it was by such means, they knew the date of their pregnancy. But the generality of women are then too much taken up with a sentiment more lively, and more agreeable, to perceive such a sensation. Let them impute to themselves, therefore, the uncertainty in which they, at this time, find the physicians whom they consult. About sixty, or fourscore years ago, they would have been much better satisfied. The physicians of that age would have told them affirmatively, that they might be certain of having conceived, when they had less eagerness for the embraces of their husbands; when their complexion was grown duskier; when their faces, particularly their foreheads, had brown spots, like those they get by being tanned with the weather; and when little worms were produced in their urine; which they took care to keep several days for that purpose.

They even carried their prognostics still farther. It was declared a woman was pregnant with a boy, if she advanced her right foot first in walking: if, on supporting herself on the arm of a settee, she did it on the right hand: if she had the right breast bigger, and firmer than the left: or, if the veins of the right hand were fuller, or bigger, than those of the left.

All these signs are found in the antient books: and, it remains to us, only to give them due honour. The last signs, on which they decided, that women were pregnant with a male, were even in consequence of an aphorism of Hippocrates: which imported, that the males were placed on the right side of the *uterus*, the females on the left; *mares dextrâ uteri parte, fœminæ sinistrâ gestantur*; which was then fully sufficient to give them authority.

But it is known at this time, that the aphorism is false: and physicians, better informed, have seen the

the error of ſuch prognoſtics; and have purged medicine of theſe abſurd notions, or to ſpeak more properly, chimera's. They are not, nevertheleſs, as yet quite annihilated. They ſubſiſt, and will ſtill ſubſiſt a long time, in the hands of nurſes and midwives; who can employ them to amuſe the credulity of thoſe whom they attend.

## CHAP IV.

### *The difficulties relating to the above doctrine of conception elucidated.*

THE explanation of the conception of animals, which has been given in the preceding chapter, is founded on certain and demonſtrable facts; and accounts, in a plauſible manner, for every thing that concerns this ſubject. Theſe are the characteriſtics of truth: but in a matter of ſo nice and complex a nature, it is not to be wondered at, if many difficulties ariſe. There are ſome which are peculiar to the opinion we follow; and, I believe, they may be reſolved by certain ſuppoſitions or conjectures, if it be allowed, which are not abſolutely proved; but which have nothing that ought to occaſion their being rejected: and I will endeavour to elucidate them, by this means, the beſt I can. There are other difficulties, which are general to all the ſeveral opinions, that can be adopted on generation: and which, I regard, as admitting of no ſolution: becauſe it is requiſite, in order to clear them up, to penetrate into the profundity of the councils and wiſdom of God, in the creation of the world. As to theſe, after having diſplayed them, and ſhewn the darkneſs in which they are involved, I ſhall confeſs my ignorance, without any compunction.

ction. For *non* * *me pudet fateri me nescire, quod nesciam*; I add, *quod non possim non nescire.*

I. They cry out against those millions of worms designed for the formation of a man: and all piteously condemned to perish; except one only, which is lucky enough to introduce itself into one of the *ova.* They may carry this reflexion further; and cry out against the millions of worms condemned to perish, without any exception, when none of them enters into any *ovum*; which happens on an infinite number of occasions. This does not particularly belong to the system we have adopted: as it combats equally every *hypothesis*, which can be embraced on this subject. But, in reality, this difficulty does not merit any place, with those who are acquainted with the history of nature; and know, that God has been attentive to multiply the germs of all the beings, which have life, to secure the preservation of the several kinds. A grain of tobacco produces a plant, which rises as a tree; and forms more than ten branches, each of which are charged with more than a hundred pods, of which every one contains more than a hundred grains: which makes the whole more than a hundred thousand grains. In the same manner, a frog spawns, in one birth, even twelve hundred eggs. The multiplicity is yet more astonishing in the viler insects; because they are more exposed to destruction. It is, by this profusion in the germs, that God preserves all the kinds of plants and animals: of which none have perished since the creation. Why then should it be supposed, that, under these circumstances, God has trusted to a small number of worms, or germs, the generation of man?

I perceive well what there is alarming in this matter. These worms of the *semen*, or germs of men, are regarded as so many *embryoes:* and there

* Cicero Tusculanar. lib. i. cap. 25.

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is fear of offending the providence, or the goodneſs of God, in ſuppoſing, that he permits the deſtruction of all theſe *embryoes*.

But there is no occaſion for apprehenſion on this point. Theſe worms, notwithſtanding the importance of their deſtination, are only poor inſects, which do not differ at all from ſo many of thoſe flies, with which ſeveral plants are covered. In like manner, is their deſtruction of no conſequence. It is only the lucky or active worm, which inſinuates itſelf into an *ovum* arrived at due maturity, and which grows there, that attains to the dignity of man, by the ſpiritual ſoul, which God unites to it: and which gains a particular diſtinction, from not being expoſed to a deſtruction ſo general.

II. They oppoſe the continuity of the umbilical cord with the *fœtus*, which is ſuch, that the umbilical arteries of the *fœtus* correſpond with the umbilical arteries of the after-birth; and the umbilical vein of the after-birth, to the umbilical vein of the *fœtus*: which proves, as they pretend, that the after-birth, and the *fœtus*, have been always united: that they have never been ſeparated: and that it is falſe, the after-birth ever belonged to the mother; and the *fœtus* to the father: as muſt be ſuppoſed in the ſyſtem I follow.

It muſt be allowed that this objection is very ſpecious: and I am not ſurprized, that it has had the effect of an illuſion. I believe, nevertheleſs, that it may be removed, by making the following ſuppoſitions.

1° That, in the worm of the father, the umbilical arteries and veins, which terminate at the navel, as thoſe here terminate in the *fœtus*, were twiſted at the end, which keeps them cloſed: but that they are nevertheleſs full of blood, or rather of lymph, that is the blood of theſe worms, which hinders their cavity from being obliterated.

2° That

2° That the worm, when it is introduced into the *ovum*, is received into a nich proportionable to its length and thickneſs: to the middle of which, the beginning of the cord is affixed: and there the ends of the arteries, and veins, are twiſted, and cloſed up, on the ſide next the worm: though, in the other parts, theſe veſſels are full of blood, or lymph, in the ſame manner, as in the body of the worm.

3° That the worm received into this nich, cannot, in conſequence of its configuration, and that of the nich, be placed but in one poſition: which occaſions its belly to be turned againſt the ſide of the nich, where the end of the umbilical cord is: and in ſuch manner, that the navel may come in contact with the end of the cord, ſo exactly, that the arteries are oppoſed to the arteries, and the vein to the vein.

4° That, by theſe means, the worm growing, the cord and the navel being cloſely applied one to the other, adhere; the end of the twiſted veſſels expand, open, and unite; the blood paſſes from the umbilical arteries of the *fœtus* into the umbilical arteries of the cord; and the blood of the umbilical vein of the cord is received by the umbilical vein of the *fœtus*. In a word, the union of the cord, and the *fœtus*, becomes as perfect, as if they had been always united.

There is an evident inſtance of a ſimilar union in the grafting of trees: a ſcion, intirely alien to it, is applied to a tree. The bark of the ſcion is cauſed to adhere to the wood of the tree; and the whole is kept in this ſtate. The bark unites; the veſſels of the two different trees, which carry the nutritious juice, conjoin, as do likewiſe the tracheas, which conduct the air; and the grafted ſcion grows, inlarges, and becomes only one tree, together with that on which it is grafted.

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I conceive it will be thought a great conceſſion, to admit the ſuppoſition I am going to make, in order to anſwer the objection that is oppoſed. But I aſk no favour; and believe myſelf able to prove the reality of the union, which I preſume to be, betwixt the *fœtus* and the cord. Three animadverſions will be ſufficient for that.

1° There is a kind of zone formed around the grafts, by the difficulty which the ſap has at firſt to paſs from the wood into the bark, which ſtops it. There is, in the ſame manner, a circular projection or zone, at that place of the cord, where it is fixed to the navel: which ſeems to prove, that it there makes a kind of grafting.

2° When the infant is born, the firſt care of the midwife, or *accoucheur*, after having tied the cord, is to cut it. Unexperienced women tremble at the ſtroke of the ſciſſars, which is given there: but the child does not cry; nor, in fact, feels any thing of it. The part is alien with reſpect to it.

3° The cord being cut and tied, does not ſeparate at the place of the ligature, as might be believed: but goes on to ſeparate farther, near the navel of the child; and almoſt at the ſurface of the ſkin: that is to ſay, at the place where the future was made: which proves, that the child, and the cord, were not originally united: and juſtifies our opinion.

Although the facts, which we have above enumerated, are concluſive, it may be thought the whole is not yet completed. It may be demanded, what it is, that forms this nich, in which we place the worm: and what becomes of it? as no traces of it are found in the after-birth of an infant formed.

The anſwer is very eaſy. This nich is formed *

* Kerckringius, *Anthropogeniæ*, Cap. I. wondered to find round the *ovum*, only a ſingle pellicle or tunic: but he could only find the *chorion*; for the *amnion*, which forms the nich, is not perceivable in the *ovum*.

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by the *amnion*, at the very beginning of pregnancy, and diſappears by the changes, which happen to the *amnion* that formed it. Lymph is gradually collected in the nich; which ſets the *amnion* at a diſtance: and the more eaſily; as the mucilaginous lymph, contained in the *chorion*, does not prevent it: becauſe it is inſenſibly diſperſed. The quantity of the lymph, flowing into the nich, augments thus daily: and the *amnion* is diſtended more and more, till ſuch time as it is brought cloſe to the *chorion*. By this means, the nich diſappears; the *amnion*, by expanding, gives a ſecond coat to the cord; and the *embryo*, eſcaped from its priſon, and ſuſpended by the cord, ſwims in the waters of the *amnion*: that is to ſay, every thing is put into the ſtate, in which it is found, in the after-birth of a perfect *fœtus*.

I advance nothing, but what may be confirmed by the ſlighteſt reflection on the uſe of the *amnion*. To what purpoſe, in effect, this ſecond covering? Is not the *chorion*, firm and denſe: as we find it ſufficient to contain the waters of the after-birth, and incloſe the *fœtus*? Can it be right to regard the *amnion* as an uſeleſs, ſupernumerary covering: or, at leaſt, not to allow it the uſe I have aſſigned?

III. Advantage is endeavoured to be taken of what I have advanced, in the beginning of the preceding chapter; to wit, that both the two ſexes contribute to generation; and that the *fœtus* reſembles both the father and mother. This fact, it is pretended, deſtroys the opinion, which I embrace: becauſe the worm, which is the germ of the *fœtus*, comes from the father only; the mother has no part in it; and the after-birth, which is ſupplied by her, does nothing to the figure, or the conformation of the *fœtus*.

This objection has conſiderable weight. I ſhall not examine, whether the common *hypotheſes* on generation remove it; though I do not believe, they do.

do. In order to ſurmount it, I will confine myſelf to that I have adopted, by which I hope to ſucceed, by taking proper advantages of the conjectures propoſed in the foregoing article.

Secondly, I ſuppoſe, that, in the worms of the *ſemen* of every man, there is the ſame conformation of body, and the ſame impreſſion of the features, as in the man himſelf. This is the foundation of the reſemblance of theſe worms to their fathers.

I ſuppoſe, in the ſame manner, that, in the little nich of the *ova* of women, there is a concave impreſſion; that reſembles every woman; and is placed in every nich, on the ſame ſide, as where the end of the cord is: which muſt be the ground of the reſemblance of children to their mothers.

From thence it comes, that the worm of a man, which enters into the *ovum* of a woman, moulds itſelf there in the nich, into which it is introduced, in a greater or leſs degree, according as it is more or leſs large, or the nich is bigger or leſs.

From whence it reſults, that by ſuppoſing the male worms are bigger than the female, as men are generally bigger than women, the male worms mould themſelves better in the womb of their mothers, than the female: and, conſequently, boys reſemble their mothers, more than they do their fathers; and girls, on the contrary, are more like their fathers than their mothers: which is intirely agreeable to obſervation.

From thence it reſults, according to the bigneſs of the worm, that there are children, who take an abſolutely new impreſſion; and reſemble intirely their mother: that there are others who do not take any at all; and who preſerve all the features of their father: and that there are others ſtill, who take only an imperfect one; and who preſerve ſo much of the likeneſs of the father, that the features of the father and mother, confounded together, may be diſtinguiſhed in them.

From

From thence it results also, that there are women, whose children all resemble them; because, the niches, wherein the children are moulded, are narrow: which occasions the children to take an intire new impression: that there are other women, all whose children are like the father; because the niches being large, they cannot be moulded at all; and preserve their original representation: and that there are likewise other women, whose children resemble both their fathers and mothers, by a confusion of features; because their niches are in a middling state; that is, narrow enough to give some resemblance of the mother; but not sufficiently so, as to efface that of the father.

I might, on the same principles, explain the degradations, which happen by the marriage of whites and blacks; and, yet more easily, the monsters which are produced by the copulation of animals of different species. But that would lead me too much from my subject; and, I conceive, moreover, that any body who will take the trouble of it, may do the same themselves.

I do not take upon me, to say so much of the internal resemblance, that children have to their parents, which occasions them to inherit their infirmities and diseases; and, what is still more astonishing, their character, humour, and genius. I confess that this research is long, and difficult: and it may probably be the case, that after having studied the subject a considerable time, there would be a necessity to put it in the list of the mysteries of generation.

IV. We shall now, taking the opportunity of the suppositions, it has been presumed might be made, in order to answer the foregoing observations, proceed to enter into the discussion of several difficulties, respecting generation, that may be resolved by them. For though these difficulties are common to all the *hypotheses* on that subject, and are inex-

plicable by any other, yet they would be a reproach to this in particular, if care were not taken to prevent it.

1° Women have generally, ſometimes boys, and ſometimes girls; becauſe among the worms in the *ſemen*, ſome are males, and others are females; and they introduce themſelves promiſcuouſly, ſometimes one, and ſometimes the other, into the *ova*, which are in a ſtate of maturity.

2° There are women, who bear only girls: becauſe, in ſuch women, the opening, by which the worm muſt be introduced into the nich, is very narrow: and it is only the female worms, therefore, which are leſs than the males, that can paſs through it.

3° There are other women, who, on the contrary, bear only boys: becauſe that, in them, the opening, which makes the entrance into the nich of the *ova*, is large enough to admit male worms; and the females, who may paſs in, all periſh there, on account of the nich's being too large for them: whence they are toſſed about without being able to affix themſelves to the cord.

4° Women have generally only one child at each pregnancy: becauſe the *ova* commonly come to maturity only one by one. The ſame is obſervable in ſeveral kinds of brute animals: as in cows, ſheep, goats, &c.

5° Sometimes, nevertheleſs, women have two children at once: which are then called twins. The reaſon is, that then two *ova* arrive together at the ſtate of maturity; and are each capable of receiving a worm. The ſame thing happens to the animals mentioned in the preceding article.

6° There are ſome other animals, which bear ſeveral young at the ſame time, as bitches, cats, ſows, &c: becauſe, in theſe animals, ſeveral *ova* attain to maturity at the ſame time.

7° There

7° There are ſeveral other animals ſtill; as pigeons, and turtles; who never ſit more than two eggs: becauſe, in them, there are only two *ova*, which arrive at due maturity together.

8° And what is moſt ſurprizing, of the two eggs, which pigeons, and turtles ſit, one always contains a male, and the other a female: becauſe, in the *ova*, the one has had the opening, through which the worm muſt paſs, ſo narrow, that none but a female worm, which is leſs than the male, could introduce itſelf; and the other has had this opening larger, and capable of receiving a male worm; while the females, that might have introduced themſelves there, would not have been able to have lived, on account of the nich's being too large: as has been ſaid in the foregoing article. When this happens, the pigeons, and turtles, lay only one egg; or, if two, the one is effete.

V. It may be aſked, how the worms in the men, and the *ova* and niches in the women, make themſelves?

But this queſtion is badly formed. For the worms, *ova*, and niches, do not make themſelves. God, who created the world, has created theſe parts; and they are the work of his all-powerful hand. May it be his will, that I may never think of imitating ſome modern philoſophers; who, following the ſteps of Epicurus, believe themſelves able to explain the formation of *embryoes*, from the re-union of different parts of *ſemen*; as he pretended to explain the formation of the world from the concourſe of atoms. It is true, knowing, it had been objected with reaſon againſt Epicurus, that the fortuitous concourſe of blind atoms could never have formed a world, ſo regular, and adjuſted with ſo much ſymmetry, as that we inherit, they contrived to give to the material parts of the *ſemen*, that are to be united, ſentiment, or an intelligence, which might render them capable of diſtinguiſhing, or

chuſing the place, that might be proper to them for forming ſuch an organized body, as that in queſtion ought to be. But this is, in other words, only the remedying one abſurdity, which they acknowledge to be ſo, by ſuperadding another, that is in fact a greater. We ſhould think it loſing time, to dwell longer on the more explicit refutation of ſuch notions. It is ſufficient, to have diſplayed them.

VI. It is granted, that the worms of the *ſemen*, the *ova* of the women, and their niches, are the work of the all-powerful hand, equally with the other parts of the human body: but it is demanded, if God forms all theſe parts ſucceſſively every day, in proportion as there is occaſion for them; or, if they were all formed by him, at the time of the creation of the world: and, in this caſe, it is further demanded, how they are tranſmitted to men, and to women, when actually living?

They who aſk this queſtion know well, there is no way of anſwering it. In general, there are very few naturaliſts, who have adopted the firſt opinion. I know only of one Engliſh philoſopher, who has embraced it: that is Dr. Cudworth, in his *True Intellectual Syſtem of the Univerſe*. But he has gone farther; and ſuppoſed, what he calls *plaſtic natures*, that is to ſay, *formatrices*, that God has created, to form the organized bodies, which it is his will to form, without their knowing themſelves that they do it. But it is difficult to comprehend, where the good is, of ſuppoſing ſuch *plaſtic natures*. Has God, who made every thing by a ſimple act of his will, who ſaid, *Fiat lux, & lux facta eſt*, need of ſuch inſtrumental cauſes, to produce what he has willed to produce? Did he employ ſuch for the creation of the world? Moreover, has any-body adopted theſe notions of the Engliſh philoſopher; and his *plaſtic natures?* Notwithſtanding the pains * Le

* In the ten firſt volumes of his *Bibliotheque Choiſie*.

Clerc

Clerc took to recommend them, they have long ſince fallen into oblivion, from whence nothing can recover them.

The common opinion is, that God has created all men, who have been, who are, or who ſhall be, in creating Adam. That they were all incloſed one within the other, in the worms of Adam, that have been all unfolded one after another, as they have grown fit; and that they will be unfolded continually, in the ſame manner, ſo long as the human kind ſhall ſubſiſt.

I do not doubt but that they, who maintain this opinion, will be frightened at the very mention of the almoſt infinite ſmallneſs, the preſent men muſt be of in Adam; and, ſtill more, thoſe of ages to come. But they will be more ſo at the calculation, I am going to make. It is true, that, to avoid indecorum, I am going to make it on an oak, and its acorns. The argument is the ſame; and has equal force.

Let us ſuppoſe, that the firſt oak, which God created, incloſed in its acorns, all the oaks ſucceſſively, which ever have been; which are; and which will be. Let us take, nevertheleſs, only one of theſe acorns; and uſe the ſame reduction in all the reproductions of oaks; which is, as it is evident, not at all to our advantage, but muſt diminiſh greatly the force of the argument we propoſe.

There was, in this firſt acorn, a little germ, which was an intire oak; that had alſo its own acorns; and each of theſe acorns had a little germ, which was another oak, that had its acorns in the ſame manner; which acorns had, likewiſe, their germs: and ſo on, as long as there ſhall be any oaks.

This makes, as appears, a deſcending progreſſion, which diminiſhes at each reproduction of an oak, according to the proportion of the firſt oak, to the germ of one of its acorns. Now this germ could ſcarcely weigh more than a quarter of a grain; and

the oak, that we will ſuppoſe of a common ſize, muſt weigh at leaſt ten quintals, or a thouſand pounds: which makes 921000 grains: or, what is equal to it, 36864000 quarters of a grain.

The firſt oak was, therefore, to the germ of one of its acorns, 36864000 to 1. This firſt germ muſt be to the ſecond germ of one of its acorns, in the ſame proportion; and the ſecond germ to the third; and ſo as to the reſt ſucceſſively. There remains nothing to fix the ſmallneſs, which one of the preſent oaks muſt be of in one of the acorns of the firſt, than to multiply 36864000, as many times by itſelf, as there are reproductions of oaks ſince the creation.

Now one may, without any ſelf-impoſition, take it for granted, that there have been ſince the creation, three hundred reproductions of oaks. Conſequently, by multiplying 368643000 three hundred times by itſelf, we ſhall find, that the largeſt of the preſent oaks was, when in the germ of an acorn of the firſt oak, where it exiſted in the ſyſtem of germs incloſed one within another, as the 20916620, &c.* part of a quarter of a grain.

Imagination cannot poſſibly keep pace with ſuch a calculation. But what is ſtill more, this germ, in order to be the germ of an oak, muſt be a mixt, compoſed of the ſame elements, as the oak itſelf. Now there is no elementary part, that can be ſo ſmall. A germ, therefore, reduced to this ſmallneſs, cannot be at the ſame time a *mixt*; nor conſequently a germ; nor conſequently any thing at all.

This calculation may be applied to the poſterity of Adam: and the ſame reſult will be found. They will, indeed, find it in a greater degree: becauſe the generations of men, from Adam to ourſelves, have been much more numerous than the reproduc-

* This *&c.* ſtands in the place of 1500 cyphers, or figures, which ought to have followed the ten firſt.

tions

tions of oaks. It will afford a very clear proof, that the ſyſtem of all the germs ſucceſſively unfolded, being included in each other, in favour of which a prejudice has ſo long prevailed, is only a vain chimera.

What can be done then in ſuch a ſituation, embarraſſed with a difficulty, that cannot be removed? What can be done? Why that, which I have ſaid more than once, and which I ſhall repeat many times again; admire the works of God; reverence and adore the profoundneſs of his wiſdom; be ſenſible of, and know the weakneſs of our light; and do not dare to attempt to penetrate the depths of his ways, which are abſolutely impenetrable. Let us imitate the wiſdom of Cicero, who, though leſs enlightened than we are, as to the nature of God, anſwered thus an objection nearly like to that which is urged againſt us, * *Non reperio cauſam*, ſays he, *latet fortaſſe obſcuritate involutâ naturæ. Non enim me Deus iſta ſcire, ſed his tantummodo uti voluit.*

## CHAP. V.

### *Of falſe conceptions.*

WE have explained, in the ſecond chapter, the regular conception, in which the *ovum* being fecundated in the *ovarium*, falls into the *corpus fimbriatum* of the Fallopian tube; and from thence into the *uterus*; where it afterwards grows: and it ought to come forth from thence at the end of nine months, in the manner that will be explained below. As this conception is conformable to the rules of nature, and tends to the generation of a child, I have thought proper to call it true conception.

* Libro 1. *De Divinatione*, cap. 12.

Obſervations, which are certain, though modern; as they do not go back farther than a hundred years; have brought to light very ſingular facts, reſpecting this matter, that were unknown to antiquity; and aſtoniſhed the firſt obſervers of them; ſo that they did not dare to admit them, at the very time, that chance preſented them to their eyes. Theſe facts are, 1° That the fecundated *ovum* remains ſometimes in the *ovarium*; and grows big there, even ſo as to produce a pregnancy in the *ovarium*. 2° That, having fallen into the Fallopian tube, it ſometimes ſtops there; and, growing, produces a pregnancy of the Fallopian tube. 3° That the *ovum*, in eſcaping from its cell, falls ſometimes into the cavity of the *abdomen*; where it grows, and gives riſe to an abdominal pregnancy. Though theſe conceptions are very real, yet as they deviate from the laws of nature, and are uſeleſs to generation, I thought fit to give them the name of falſe conceptions.

The art of medicine does not offer any aſſiſtance to prevent theſe conceptions; and to remedy the bad conſequences of them. Nevertheleſs, to give a complete idea of generation, it is neceſſary to examine them, each in particular; to diſtinguiſh the known cauſes of them; and to indicate the means of giving relief againſt them, ſuppoſing there be any.

## § I. *Of the conception or pregnancy of the* ovarium.

Inſtances of the conceptions, or rather pregnancies of the *ovaria* are rare. The firſt, that has been known, was obſerved in 1682, by a phyſician of Perigord, called Saint Maurice. The account of it is found in a letter, which was inſerted in a French journal, compoſed by the Abbe de la Roque. Every body has ſpoken of this inſtance; and Saint Maurice's whole letter may be ſeen, tranſlated into Latin,

Latin, in the *Bibliotheque Anatomique* of Manget, *Tome premier*, pag. 623.

In this caſe, the *fœtus* was found in the cavity of the *abdomen*, ſwimming amidſt a great quantity of blood; but the accidents, which preceded, and particularly the laceration of the *ovarium*, evinced, that it had been nouriſhed there; that having become too big, it had torn the *ovarium*, and fallen into the *abdomen:* and that the making this laceration had been the cauſe of the death of the patient, either by a violent *ſyncope*; or by the hæmorrhage which the ſolution of continuity occaſioned. As to other circumſtances, the *uterus* was ſound and whole; as well as the Fallopian tubes; which left no room to ſuſpect, that the child had come out of them.

Mr. Montagnier, a phyſician of Lambeſe in Provence, made an obſervation nearly ſimilar. A woman of Lambeſe, dying ſuddenly with acute pains in the *abdomen*, and after ſeveral great faintings, he had her opened, to diſcover the cauſe of a death ſo unaccountable. He found, in the *abdomen*, a *fœtus*, of about two months old, ſwimming in much blood, without any injury, that appeared to be done, either to the *uterus*, or to the Fallopian tubes: but he obſerved, that the *ovarium* of the right ſide was very much ſwelled, and torn in its inferior part: from whence it was evident, that the *embryo* had fallen into the *abdomen.* Mr. Vieuſſens had recited this obſervation, in his diſſertation, *De ſtructurâ & uſu uteri & placentæ*, which is found at the end of the ſecond volume of the Anatomy of Verheyen, the laſt edition.

There is a third obſervation, more certain yet, which we owe to Mr. Littre*; who reported it to the Academy of Sciences, in 1701. He aſſures us, "He found in the left *ovarium* a veſicle, containing "a *fœtus*, of the thickneſs of a line and a half: and

* Memoirs of the Academy of Sciences, ann. 1701, p. 109.

"of

" of the length of three lines." As ſmall as this *fœtus* was, Mr. Littre ſays, " That he diſtinguiſh-
" ed in it, very ſenſibly, the head with a little
" opening in it at the place of the mouth; a little
" eminence at the place of the noſe; and a little
" line on each ſide of the root of the noſe. He
" believes, that theſe two little lines were the open-
" ings of the noſtrils. He perceived, alſo, on
" each ſide of the bottom of the trunk, an eminence
" which was round, and large as the head of a
" middling pin: and, at the two ſides of the upper
" part of the trunk, two other eminences, that were
" round likewiſe, but ſmaller: and judged, that
" theſe eminences were the origins of the ſuperior,
" and inferior extremities of this *fœtus*:" and he adds, " That the *fœtus* adhered to the interior part
" of the *veſicle*, where it was held by a cord of the
" thickneſs of the third of a line; and of the length
" of a line and half:" which proves, that this veſicle was its after-birth.

The hiſtory of the Academy of Sciences, year 1756, pag. 48, furniſhes a fourth obſervation, by Mr. Varocquier, demonſtrator of anatomy at Liſle: which he made in opening the dead body of a woman, in that city, aged thirty years; who died of a fixt pain in the iliac region of the left ſide. *The left* ovarium *was of the ſize, and figure of a hen's egg.*
" Mr. Varocquier, having opened it, there came
" out about an ounce of a lymphatic fluid like
" whey: and he found there a *fœtus*, a little ſhrivel-
" led, with a *placenta*; and an umbilical cord well
" formed; being an inch and a half long, and ſome
" lines in circumference. The *placenta* adhered to
" the top of the ſubſtance of the *ovarium*; with
" which it was confounded: the *fœtus* was two
" inches in length, from the top of the head to the
" knees, the reſt of the inferior extremities, which
" were ſhrunk, were only of the length of two lines.
" The thighs were lying along the belly; and even
" cohered

" cohered with it: and the arms, alſo, cohered with " the *thorax*; being four or five lines long, from " the ſhoulder to the elbow: but the reſt of the " ſuperior extremities was only of about the length " of two lines." In this obſervation, the *fœtus* was larger; and the ſuperior, and inferior extremities, begun to be formed: which proves that the *fœtus* was older than the other we have juſt before ſpoken of, that fell under the obſervation of Mr. Littre, in a parallel caſe.

To the conceptions of this kind, where the germ periſhes in the *ovarium* itſelf, we muſt aſcribe the incyſted tumours, that are found in the cellular ſubſtance of the *ovaria*, in the form of ſteatomas, atheromas, and meliceriſes, full of a caſeous, ſebaceous, or purulent matter, more or leſs thick; and of different colours, brown, green, or yellow: in which are often found little balls of hair. Ruyſch * pretends alſo, once even to have found a range of teeth: which is confirmed by an obſervation of Mr. le Riche, ſurgeon at Straſbourg, related in the Memoirs of the Academy of Sciences. *Hiſtoire de l'Academie des Sciences, ann.* 1743, *p.* 88.

It appears, by what is here mentioned, that the conceptions of the *ovaria* are of three kinds. 1° They ſometimes form a little ſteatomatous tumour, which is the caſe we have juſt before ſpoken of, that grows bigger gradually; and inlarges the *ovarium* in proportion: and that is borne a long time without any remarkable inconvenience; but, at laſt, in conſequence of augmenting, changes often into a purulent abſceſs, which draws on a ſlow fever; produces ſometimes a dropſy in the *ovarium*, and even in the *abdomen*; and, opening at other times into the *abdomen*, cauſes accidents ſtill more fatal: as we ſhall ſee below. 2° At other times the *ovum* is retained in its cell; and the *embryo* lives there, grows

* Adverſar. Anatomic. *decad.* III. p. 6 & 20.

there,

there, and unfolds itſelf, by not only diſtending the cell, but the body of the *ovarium* itſelf; which, however, is not brought about without pain. It dies there nevertheleſs ſoon, either for want of room; or becauſe the bottom of the cavity to which it adheres, does not furniſh a ſufficient quantity of nouriſhment: this is the ſecond caſe; as obſerved by Mr. Littre, and Mr. Varocquier. 3° It ſometimes happens, alſo, that the *embryo*, by growing, tears the cell, in which it is contained; and falls into the *abdomen:* which cannot be done without very acute pains, and great hæmorrhage; that ſoon carry off the mother. Such is the *firſt caſe* related by Mr. Saint Maurice, and Mr. Montagnier.

The firſt of theſe caſes, where the *embryo* periſhes very early, may happen from ſeveral cauſes, that it is difficult to conjecture: but which may be ſlight. For very little is required to make it periſh. Perhaps the worm finds itſelf too much ſtraitened for room in its nich: or perhaps its navel has not united with the umbilical cord. But I imagine, that what moſt frequently conduces to this effect, is the fear, ſhame, and confuſion, that women have in an illicit embrace; which ſuſpends, interrupts, and diſorders the oſcillations neceſſary to fecundation: and which give room for the ſuſpicion, that theſe accidents are more common in unmarried girls and widows; and, particularly, thoſe who have paſſed for modeſt.

In this caſe, the *embryo* diſſolves; and being mixt with the lymph of the *ovum*, forms the matter of the ſteatomatous tumour. The hair is ſometimes diſtinguiſhed in it: which, however imperceptible it may be in the *embryo*, grows perhaps in this matter, and forms little balls of hair, of ſome length. The germs of the teeth moreover ſometimes harden in it; and grow there: if the obſervation of Ruyſch, and that of the Sieur Riche, a ſurgeon at Straſbourg, which are mentioned above, be true.

true. It is not impoſſible, that this tumour may form a *ſchirrhus*, by the induration of the matter, which it contains: or that it may turn to an abſceſs, when the matter is converted into *pus:* but theſe caſes are rare.

The diagnoſtic of theſe ſeveral ſtates is very difficult: and, conſequently, the prognoſtic very uncertain. It has been already ſaid, that the art of medicine cannot prevent theſe miſchiefs; nor find any remedy for them. At moſt it can only apply general medicines; that are mollifying, diſſolving, or diluting: and they vary according to the circumſtances.

II. In the ſecond caſe, where the child lives a longer time in the *ovarium*, as Mr. Littre and Mr. Varocquier obſerved, it unfolds itſelf; becomes large; and, by growing, augments the volume of the *ovarium:* but, nevertheleſs, it does not live a long time: either becauſe it wants room; or becauſe the bottom of the cell, to which it is united, cannot yield it ſufficient nouriſhment. The mother feels ſome tenſion, or dead pain, in the region of the *ovarium*, on account of the *embryo*'s growing bigger; and dilating the *ovarium* But, when it is dead, this tenſion becomes almoſt inſenſible.

The *embryo*, being dead in the *ovarium*, may, by putrefying, form an abſceſs there; and, by becoming dry, a kind of *ſchirrhus*. The firſt caſe may give riſe to a fever; if the abſceſs be great: or both may cauſe a dropſy in the *ovarium*.

There are no ſigns which can manifeſt either this kind of conception; or the accidents that accompany it. But, even if we were better informed, of theſe two articles, there are no means of remedying them; and we could employ none but general medicines; as has been ſaid in the preceding article.

III. When the *embryo* lives ſome time in the *ovarium*, as in the caſe obſerved by Mr. De Saint Maurice,

Maurice, the mother, as long as it grows, feels very acute pains in that part, by the diſtenſion of the coat of the diſeaſed *ovarium:* and theſe pains, which are excruciating, when the child comes to tear it, throw the mother almoſt into a continual *ſyncope*; that only ends at her death, cauſed by the hæmorrhage which this dilaceration brings on.

In this caſe, one can neither judge of the nature of the diſeaſe; nor foreſee the danger: and even, if both could be known, every means of remedy is wanting.

## § II. *Of the conception, or pregnancy of the Fallopian tubes.*

The pregnancies of the Fallopian tubes are not rare: but they were not, however, known to the antients. John Riolan, in his *Anthropographia*, which he publiſhed in 1650*, declares, that ſixty years before, that is to ſay, in 1590, a ſurgeon had obſerved ſuch a pregnancy: but, as he did not underſtand it, there was nothing explained about it. Fifty years after, that is, in 1640, another ſurgeon ſaw one of the ſame; as Riolan ſays: but this obſervation was ſtill neglected. Afterwards Riolan had an opportunity of ſeeing one himſelf, in a waſher-woman belonging to queen Anne of Auſtria, who was opened in the preſence of the queen's firſt phyſician (Peter Seguin): but Riolan himſelf was not credited; and Guy Patin, his friend, told Bartholin†, that he did not believe what he had declared; but that he only reported the fact out of complaiſance to a phyſician of the court, meaning the firſt phyſician to the queen.

A little time afterwards, in 1669, a ſurgeon of Paris, called Benoit Vaſſal, had an opportunity of

* Libro II. cap. 35.

† Bartholin rapporte, *Anatom.* lib. I. cap. 17.

ſeeing

ſeeing a pregnancy of the Fallopian tube; which he did not underſtand: and he took the Fallopian tube where the *fœtus* was depoſited, for a fecundated *uterus*. Mauriceau*, a celebrated *accoucheur*, who examined the fact, ſaw readily that it was not a fecundated *uterus*; but, inſtead of diſtinguiſhing that it was the Fallopian tube, he maintained, that this bag, in which the *fœtus* was incloſed, was a ſimple herniary expanſion of the *uterus*.

At laſt he was obliged to give up the point; and the pregnancies of the Fallopian tubes have ſince preſented themſelves to ſo many obſervers, that they cannot at this time be miſtaken. Their reality has been for a long time granted: and ſo many authors have taken it upon them, to publiſh the obſervations they have made, that I could form a great liſt of them; but I think fit to content myſelf with quoting thoſe which have been given by the moſt celebrated anatomiſts, whoſe authority cannot be conteſted: as Regner de Graaf, Buſſiere †, Dionis ‡, Littre ‖, and Duverney §.

In all theſe caſes, the fecundated *ovum* falls from its cell in the *ovarium*, into the Fallopian tube; which ought to convey it into the *uterus*; but fails then to perform this function, either becauſe that it is half cloſed; or becauſe it has its cavity diminiſhed, by the contraction of the circular fibres of its coats; or by ſome tubercle formed in it. As theſe obſtacles do not hinder the *ovum* from being impregnated, nor, conſequently, the *ſemen* from riſing to the *ovarium*, it muſt be ſuppoſed that they ſupervene after the fecundation: or, what is more probable, that they only ſtop up the paſſage of the Fallopian tube imperfectly enough to obſtruct the

* *Traité des Maladies des Femmes groſſes*, livre I chap. 5.

† Paul Buſſiere, chirurgeon, *Tranſactions Philoſophiques, ann.* 1694, *N.* 20, *art.* 2.

‡ Anatomie de l'Homme, VI. *edition, p* 212, *and the following.*

‖ Memoires de l'Academie des Sciences, *année* 170.., *p.* 234.

§ *Ibid.* p. 298.

fecundated

fecundated *ovum*, but not ſo as to hinder the *ſemen* from finding its way through, to fecundate it.

The *ovum* in the Fallopian tube is nouriſhed, and grows there, becauſe its *placenta* adheres to the inferior coat; which is analogous to that of the *uterus*; and proper to furniſh the *embryo* with a ſuitable fluid. In fact, this nouriſhment is but moderate. It is, however, ſufficient at firſt, while the *embryo* is ſmall: but as it is not ſo when it is bigger; the reaſon ariſes thence, why theſe *embryoes* ſcarcely ever live, in the Fallopian tube, longer than the fourth, fifth, or ſixth month at moſt.

In the beginning, the mother believes herſelf with child. She has all the accidents common to pregnant women: nauſeas, longings for odd things, heart-burn, diſpoſition to worms, ſuppreſſion of the *menſes*, &c. and ſhe perceives nothing with relation to the Fallopian tube, where the *ovum* is retained, that can give her the leaſt ſuſpicion of her real ſtate. But, when the *ovum* grows larger, ſhe feels, in that part, a tenſion, uneaſineſs, and dead pain, which go on increaſing, in proportion as the ſize of the *ovum* increaſes: particularly when it is ſtrong enough to move; or, at leaſt, to ſtretch itſelf. She can even diſtinguiſh its motions, when the *fœtus* lives, in the tube, to the fourth month.

In the pregnancies of the Fallopian tubes, two caſes preſent themſelves. The one, when the *fœtus* remains in the tube, either becauſe the tube is too weak, or too denſe. The other, when the *fœtus* tears the tube; and falls into the cavity of the *abdomen*.

I. In the firſt caſe, the miſchief may happen in three manners. 1° Sometimes the *fœtus* dries; grows horny; and is covered with plaſtery tartar, that the tube furniſhes; and there forms a *ſchirrhus*, which extends, and communicates itſelf often even to the tube. 2° Sometimes its fleſh, degenerated into a thick matter, produces a *ſteatoma*; in which are found

found the bone undiſſolved. 3° The fleſh ſometimes changes into *pus*; and forms an abſceſs. Which ever way the thing may happen, the mother feels tenſion, on the diſeaſed ſide; falls at length into a ſlow fever; and ſometimes becomes dropſical.

As the ſwelling, and pain, indicate, that the diſorder is in the Fallopian tube; as there is, ſometimes, even an opportunity of perceiving the motion of the *fœtus*; and as, in every caſe, the mother may make it certain; a diagnoſtic, ſufficiently well grounded, may be thence made: and judgment may be formed of the danger of the diſeaſe. But this does not furniſh any other means of remedying the caſe, than through thoſe of the Ceſarean operation, by opening the *abdomen*; and taking out the *fœtus* from the Fallopian tube. In propoſing this expedient, it is not an ideal means of relief that is offered Abraham Cyprianus, profeſſor of anatomy and ſurgery, in the univerſity of Franequer, performed it with ſucceſs, in a ſimilar caſe, in the beginning of this century: though I ſuſpect, in the Ceſarean operations, which have ſucceeded ſo well with country ſurgeons; and of which ſeveral obſervations are reported; it is not out of the *uterus*, but the Fallopian tubes, that the *fœtus* has been taken.

II. In the ſecond caſe, where the *fœtus* is ſtrong enough to tear the tube, and does actually tear it, the mother often dies, either by the mortal *ſyncope*, cauſed by the violence of the pain; or, rather, by the hæmorrhage, which this laceration brings on. It happens ſometimes, nevertheleſs, that the mother ſupports this trial, when the coats of the tube are thin, and tear without much pain; particularly when the blood veſſels, being very much compreſt, can ſupply but little blood. In this ſtate, whether the child ſurvive, or whether it be dead, the diſeaſe

changes its name, and becomes an abdominal pregnancy, of which we are going to ſpeak.

## § III. *Of abdominal pregnancies.*

Abdominal pregnancies are more rare, and leſs known, than thoſe of the Fallopian tubes. They are diſtinguiſhed into three kinds. In the firſt, the fecundated *ovum*, inſtead of falling into the Fallopian tube, falls into the cavity of the *abdomen:* which happens, becauſe the *corpus fimbriatum* of the tube is not applied to the centre of the *ovarium*, or is unduly applied to it; becauſe it is thick and horny; becauſe it has not the mobility, and contractibility, that are natural; or, becauſe its motion has been ſuſpended, or interrupted, by ſome paſſion of the mind, ſome pain, or ſome fright.

What is moſt ſurprizing is, that the fecundated *ovum*, fallen into a place which is not formed to receive it, finds wherewithal to be nouriſhed there. It is true it requires but little nouriſhment at firſt; and the lymph alone, that moiſtens the parts of the *abdomen*, may ſuffice: nevertheleſs, there is occaſion afterwards, for more abundant nouriſhment: and then its *placenta* adheres to the parts, where it can reach: as, to the exterior ſurface of the bowels; particularly the *colon*, *uterus*, meſentery, or *peritonæum.* But with all this, if theſe *fœtuſſes* arrive at their full time, it muſt be in a very extenuated ſtate.

There are ſome inſtances of this kind of pregnancy. One of thoſe moſt known is, that of Mr. Courtial, profeſſor of phyſic at Tholouſe, related in his treatiſe, called, *Nouvelles* * *Obſervations ſur les Os.* The *fœtus* of which he ſpeaks, was nine months old. It was found on the left ſide of the *abdomen*, with the head loweſt, and feet higheſt, held by the

* Obſervat. x.

cord

cord of the *placenta*; which adhered to the *epiploon*, and the ſtomach. It was rendered certain, by a careful examination, that there was no laceration, either in the *uterus*, *ovarium*, or Fallopian tube: ſo as to leave no room for doubt, but that the *ovum* came down immediately from the *ovarium*.

The obſervation of Mr. Jouy, ſurgeon of the *Hotel de Dieu* at Paris, related by Dionis *, is nearly ſimilar. According to the account of this ſurgeon, the *fœtus* was nine months old. It was on the left ſide of the *abdomen*, in a cavity full of bloody water: its cord, to which it adhered, was united to the *placenta*, next to the meſentery and colon. There was no laceration perceived; nor any *cicatrix* in the *uterus*, Fallopian tube, or *ovarium*. I am of opinion, that, to the ſame caſe, muſt be referred the obſervation which two phyſicians of Joigny communicated to the Academy of Sciences, in the year 1748; and which is found in the memoirs of that year, page 108. This obſervation relates to a *fœtus*, borne thirty years in the womb of its mother. They found it, when ſhe was opened, on the right ſide of the *abdomen*, covered with coats become thick and hard, which adhered to the *epiploon*, *peritonæum*, meſentery, and the outſide of the *uterus*. The *fœtus* was well formed, with hair and two fore teeth, ready to cut; and without any hurt appearing either in the *uterus*, Fallopian tube, or *ovarium*, of the ſame ſide.

The *ſecond* kind of abdominal pregnancy is more common: but ſcarcely merits that name. In this pregnancy, the *fœtus* is not nouriſhed in the belly; but falls into it already nouriſhed, from the *ovaria*, or the Fallopian tubes, when it is too big to be contained there. For the moſt part, it periſhes in falling down thither; and makes its mother periſh with it. Sometimes, nevertheleſs, the mother ſur-

* Anatomie de l'Homme, VI. edition, pag. 223, 227.

vives: eſpecially when it is from the Fallopian tube, the *fœtus* is ſeparated.

The firſt obſervation of *M. de Saint Maurice*, which we have above quoted, in *ſect.* I. furniſhes an inſtance of an *embryo*'s falling from the *ovarium*, into the cavity of the *abdomen*. The obſervation of the *Sieur Vaſſal*, cited in the ſecond ſection, preſents an inſtance of a *fœtus*'s having got out of the tube. It would be eaſy to make an accumulation of ſuch inſtances: but the labour appears to me uſeleſs.

The *third* kind of pregnancy of the *abdomen* does not merit at all the name; ſince it never happens, but when a vigorous child, at its full time, being placed croſs-wiſe in the *uterus*; or finding ſome obſtacle, which ſtops its paſſage through the *vagina*; tears the *uterus*; and makes its way into the *abdomen*. Inſtances of this are not rare: but I ſhall content myſelf with producing that of a child at Tholouſe, which remained twenty-five years in the *abdomen* of his mother; inſtead of paſſing the uſual way, at the end of nine months. It had got out into the *abdomen*, through a hole that it had made in the *uterus*; and that was ſtill to be ſeen, after twenty-five years, when the dead body was opened.

The accidents, which theſe children bring on in theſe different caſes, vary much.

1° Sometimes the children dry, grow horny, and become gradually covered with a tartarous and plaſter-like cruſt, which the mucous ſecretion of the neighbouring parts ſupplies; and, in this ſtate, they keep a long time. They are called *Lithopædia*; that is to ſay, *petrified fœtuſſes:* though they are not in fact petrified; but covered only with an incruſtation; that is no proper part of them.

Such was the child at Sens*, *Lithopædium Senonenſe*, in 1582. The mother bore it twenty-eight

* Johannis Albofii *Obſervatio Lithopædii Senonenſis*—Senonis, in 8vo. 1582.

years.

years. It was taken out of her belly, after her death, covered with a plaſtery cruſt: but it was in the cavity of the *uterus*.

Such was alſo the child of *Pont-a-Muſſon**, *Lithopœdium Muſſi-pontanum*, in 1659; which remained thirty years, in the body of its mother: from whence it was taken out when ſhe was opened. It was incruſted, in the ſame manner, with a plaſter-like coat: and the *uterus* was found intire, without laceration, or *cicatrix*.

The truth of this obſervation was at firſt doubted: which is not to be wondered at. It was a new and ſingular obſervation, that preſented a *fœtus*, formed and nouriſhed out of the *uterus*: which overturned all the notions that were then entertained with relation to generation; and was therefore ſufficient to render the obſervation ſuſpected. But ſo many ſimilar, or analogous, inſtances have been ſeen ſince, that no-body doubts, at preſent, the truth of the obſervation.

Such was the child of Dolé in Franche-Comte, *Lithopœdium Dolanum*, in 1661; which the mother bore to the time of her death, for ſixteen years. It was covered, in the ſame manner, with a plaſter-like cruſt; but there is ground to believe, it was in the *uterus*: at leaſt the relations of it do not give any clear explanation of the contrary.

We owe the relation of this fact † to Francis Bouchard, profeſſor of phyſic in the univerſity of Dole, which was ſince removed to Beſançon in 1691.

* Honoratus Maria, Lautier, Aquenſis. *De Fœtu Muſſi-pontano*. Aquis-ſextis, in 4to. 1660.

Laurentius Strauſſius, *Reſolutio obſervationis ſingularis Muſſi-pontanæ fœtûs extra uterum in abdomine retenti, tandemque lapidescentis*. Darmſtadii, in 4to. 1661.

† Vide Epiſtolam Franciſci Bouchard, Medici Biſuntini, in M. N. C. *Decad.* 1. *Ann.* 3. *anno* 1672.

Et Arnoldi Senguerdii *Diſcurſum de Oſtento Dolano*. Amſtelodami, 1662, in 12mo.

He communicated it afterwards to the editors of *Ephemerid. Curiosor. Natur.* in Germany; who, having abridged it, and translated it into Latin, inserted it, in 1672, in their journal, *Decad.* I. *tom.* 3. *Observ.* xii. with some other observations, which he sent at the same time.

Such was, moreover, the child of Tholouse *, *Lithopædium Tolosanum*, in 1678; which was found covered with a plaster-like crust in the *abdomen* of the mother; where it had been twenty-five years: having made a passage thither, in a difficult labour, by tearing the *uterus*; as appeared on opening the woman.

2° At other times, these *fœtusses* putrefy, and are converted into a kind of anomalous *pus*, acrid, and corrosive, that ulcerates the neighbouring parts, and mortifies them; which brings on the death of the mother: and this case is the most common.

3° Lastly, at other times, they fall into a slow putrefaction; of which the *pus* is less acrid: which gives time to the *fœtus* to bring on a still kind of suppuration in the parts with which it is in contact; to form abscesses in them; and to open, by this means, a vent, that has a tendency to save the mother. It is thus, that in the observation related by Mr. Bianchi †, professor of physic at Turin; and by Mr. Calvo ‡, surgeon; the beginning of an abscess in the navel was formed. It was, in the same manner ||, also, that, according to the relation of the same writers, all the bones, and putrid flesh of a *fœtus*, fallen into the belly, made their way out by several abscesses, which were formed in different places of the *abdomen*. It is thus, that a woman at Brest, as Dionis § relates, discharged, by an opening

* *Epistola* Francisci Baile, Professoris Tolosani, edita Tolosæ, *anno* 1678.

† In Historiâ naturalis & vitiosæ generationis. pag. 84-100.

‡ Histoire de l'Academie des Sciences, *année* 1714.

|| Ubi suprà, pag. 101.

§ Anatomie de l'Homme, VI. edit. pag. 328—331.

made

made in a tumour, formed in the umbilical region, an aſtoniſhing quantity of very fetid *ſanies*; and afterwards all the bones of a *fœtus*. It is thus, that a woman at Paris voided, by the fundament, all the bones of a *fœtus*, putrified on the bottom of the baſin: firſt having made an abſceſs in the membranes of the *rectum*, which divided them. Mr. Littre*, to whom we owe the particulars of this obſervation, facilitated this extraordinary kind of delivery with a degree of care and ſkill, that merits the greateſt praiſe. There is found, ſince that time, in the *Hiſtory of the Academy of Sciences*, of the year 1746, *page* 43, 44, an obſervation on a woman, who voided, by the fundament, piece by piece, and without much pain, a *fœtus* of five months, which had periſhed in her body, by a fall on a pavement. I remember, that in 1705, there happened a delivery of this kind to a ſhepherdeſs, near Lunel; who diſcharged, by an abſceſs that formed in the *anus*, bones, teeth, and hair; which evinced there had been an abdominal conception. They debated much at Montpelier on this event; and badly enough: becauſe they were not, at that time, acquainted with theſe kinds of conceptions.

* Memoires de l'Academie des Sciences, *année* 1702.

# CHAP. VI.

## *Of barrenneſs.*

### § I. DESCRIPTION.

A WOMAN is ſterile or barren, when, being of a proper age for generation, which laſts generally from the fourteenth to the forty-fifth year of age; enjoying, otherwiſe, good health; and being in a ſituation, where women have children; ſhe does not conceive. Barrenneſs, therefore, is an incapacity of conceiving, in a healthful woman; of a fit age; and married to a man who is young, hearty, and loves her.

It is proper to diſtinguiſh two ſorts of barrenneſs. The one *abſolute:* that ſubſiſts under ſeveral marriages, which a woman may ſucceſſively make: and the other *relative*, which, whatever pains may be taken, ſubſiſts in a firſt marriage with a huſband who has already had children, and who ſometimes has them ſtill; but which ceaſes, when, becoming a widow, ſhe proceeds to a ſecond marriage, without any change happening in her. As the cauſe of theſe two kinds of barrenneſs are different, it is proper to explain them ſeparately.

### § II. CAUSES OF BARRENNESS.

#### *Cauſes of abſolute barrenneſs.*

All the circumſtances, requiſite to conception, have been noted above, *Chap.* III. Nothing more is wanting, therefore, here, but to recapitulate them ſummarily, in order to be able to judge of the cauſes of abſolute barrenneſs. But it muſt be obſerved,

ſerved, that, as the concurrence of all theſe circumſtances is neceſſary, in order that a woman may conceive, and become fruitful, it ſuffices, that one of them only be wanting, in order to the rendering her incapable of it: and to her continuing ſo. *Bonum enim à complemento cauſarum omnium, malum à quocunque defectu.*

The circumſtances, requiſite to the rendering a woman able to conceive, are many; but as they have been already explained in particular, it is only neceſſary to enumerate them here.

1° That the ſeminal fluid of the male penetrate to the *fundus* of the *uterus*.

2° That the *uterus* be ſound, and not infected with any vitious humour, capable of altering the quality of the ſeminal humour, when received: that is to ſay, of deſtroying the worms, which are in it.

3° That the *uterus* be ſupple, pulpous, and in a ſtate to execute all the motions, which ſhould concur in order to conception.

4° That the edges of its orifice ſhould be even, flexible, and capable of cloſing itſelf, and ſhutting up the opening.

5° That the openings of the Fallopian tubes ſhould be, at leaſt one of them, free, and even dilated by the contraction of the radious fibres, which ſurround it; and their canals unobſtructed for their whole length.

6° That the *uterus* ſhould be ſufficiently ſenſible to the titillation of the *ſemen*, to cloſe or contract itſelf; and puſh the ſeminal fluid into the tubes; or at leaſt into one of them.

7° That the ſeminal fluid, when it gets into the *ovaria*, ſhould find the Fallopian tubes oppoſed to their inferior part, where the *ova* are; and by ſuch means, diſpoſe them to retain that fluid againſt the inferior ſurface of the *ovaria*.

8° That the *ovaria*, or, at leaſt, one of them, be ſound, and free from any *ſchirrhus*, abſceſs, *ſteatoma*, or

or dropſy, that may have depraved, or deſtroyed the conformation.

9° That, in this ſtate, one of the ſmall worms, which are in the ſeminal fluid, find at leaſt one of the niches, that are in the coats of the *ovaria*, ſufficiently dilated, to admit its entrance.

10. That this worm, moreover, find an *ovum* arrived at its requiſite magnitude, or, as it is called, at maturity; and perforated, at a determined place, with a hole large enough to receive it.

11° That this *ovum* ſhould not be diſeaſed, vitiated, or rendered incapable of its office; but ſuch as it ſhould be, in order to be ſuſceptible of the changes, which the introduction of the little worm ought to produce in it.

12° And that there ſhall not happen to this *ovum*, thus fecundated, any accident, which may make it periſh in the *ovarium*, or the Fallopian tube; or which may retain it in either of thoſe parts. For natural conception is not perfect, till the fecundated *ovum* be conveyed into the *uterus*.

To judge, by the number of requiſite circumſtances, we have here enumerated, it might be imagined, that conception was very rarely performed. It is performed, nevertheleſs, very often; and very ſucceſsfully. For which we ought to admire the wiſdom and bounty of God, who has diſpoſed things with ſo much intelligence, that all theſe circumſtances concur, and combine; and that conception, ſo neceſſary to the propagation of the human kind, is duly performed. It happens ſometimes, nevertheleſs, that it fails, from the default of ſome of theſe circumſtances: and how this fault does happen, is a ſubject proper to be examined, in order to know the cauſes of abſolute barrenneſs.

I. It is neceſſary, that the ſeminal fluid be thrown into the *uterus*; and there may be ſome difficulty with regard to that.

1° When

1° When the *vagina* is too long. But nature has provided againſt this, on the one hand, by the contraction of the longitudinal fibres of the *vagina*, which ſhorten it according to the occaſion; and, on the other, by the contraction of the round ligaments of the *uterus*, which bring forwards its orifice into the *vagina*. Thus, indeed, this fault of the *vagina* may render conception more difficult; as ſome obſervations prove: but it is rare, that it makes a conſtant obſtacle; at leaſt, unleſs the muſcular fibres of the *vagina*, and the round ligaments, be relaxed, or paralytic: which however is not impoſſible.

2° When the radious fibres, which ſurround the orifice of the *uterus*, having become incapable of action; or, being relaxed; do not dilate at all; or dilate imperfectly, in ſuch manner, that the ſeminal fluid cannot be received; and runs to waſte.

3° When the orifice of the *uterus* is ſtopt up by an excreſcence, or a tubercle, preternaturally; or by the ſchirrhous, or carcinomatous ſwelling of its own ſubſtance: which makes a certain impediment to conception; as is juſtified by ſeveral obſervations.

4° When the orifice of the *uterus*, inſtead of preſenting itſelf in a right direction to the *vagina*, is turned aſide to the right or the left; or upwards or downwards; in ſuch a degree, that the ſeminal fluid cannot find a paſſage through it: which alſo happens when the *uterus* itſelf is in a ſituation too oblique.

II. It is requiſite, that the *uterus* be in a healthful ſtate, and not affected by any vicious humour. It is by this means, that conception fails in women, who have a cancer, or an ulcer, in the *uterus*: which deſtroys the worms in the *ſemen*. The *fluor albus*, when it is acrid, produces the ſame effect: perhaps, moreover, in ſome women, the heat of the *uterus* is ſufficiently great to deſtroy the ſeminal worms; and cauſe barrenneſs.

III. It

III. It is requiſite, that the *uterus* ſhould be ſupple, pulpous, and in a condition to execute all the motions, which muſt concur in order to generation; which fails, when the *uterus* is ſchirrhous, full of obſtructions, hard, and horny, in default of the *menſes* having never flowed; or, having failed to do it of a long time. From hence it reſults, that all theſe faults of the *uterus* muſt be enumerated among the cauſes of barrenneſs, according to the acknowledgement of all phyſicians.

IV. It is requiſite, that the edges of the orifice of the *uterus* ſhould be ſoft, flexible, capable of cloſing and ſhutting up the orifice, to hinder the ſeminal fluid, when it is in the *uterus*, from running back into the *vagina:* which happens when theſe edges are hard, ſchirrhous, or unequally tumefied. In which caſe, the *ſemen* running back, conception cannot be performed: becauſe the *ſemen* does not enter into the Fallopian tubes.

V. It is neceſſary, that the Fallopian tubes, or, at leaſt, one of them, be opened, to receive the *ſemen*, and carry it to the *ovaria*. It has been obſerved, that the extremity of the tubes has been ſometimes cloſed. The caſe is very real; although not ſo common, as ſome anatomiſts * have believed it, and in this ſtate there can be no conception. It is requiſite, even that this opening into the Fallopian tubes be dilated on this occaſion, by the ſimultaneous contraction of the radious fibres, which ſurround it: and this certainly happens in women, who are prolific. I will not aſſert, that the default of the contraction of the muſcular fibres always hinders

* Ruyſch has ſaid, in his *Obſervations Anatomico-chirurgiques*, *Obſervation* 83. that the Fallopian tubes were often obſtructed in women. Morgagni, after having mentioned the opinion of Ruyſch, contradicts it, *Adverſar. Anatom.* I. p. 40. and maintains, that, in fact, it often appears the tubes are ſtopt up: but that, on examining the matter with attention, it will be found to be rare in reality.

conception,

conception, when the Fallopian tubes are open enough of themſelves: but it is certain, that it is injurious to it. It is neceſſary, moreover, for the ſame reaſon, that the paſſage of the Fallopian tubes be free, and open, throughout all its length. For when it is not ſo; it produces one cauſe of barrenneſs.

VI. It is neceſſary, that, at the ſame time, the orifice of the *uterus* is cloſed, and the radious fibres, by contracting, dilate the Fallopian tubes, the *uterus* muſt become round, and be cloſed, to puſh the *ſemen*, which it contains, into the tubes; and to make it aſcend, even to their *corpus fimbriatum*. Theſe ſimultaneous contractions, requiſite to conception, are performed by the laws of ſympathetic motion, occaſioned by the lively titillation, that the *ſemen* impelled into the *uterus*, excites in its interior coat, ſo long as it has the due ſenſibility. But if this ſenſibility fail, either becauſe the coat is naturally lax; becauſe it is over-moiſtened by the *fluor albus*; or becauſe it is too denſe, and as it were horny, in conſequence of the defect of the *menſes*; theſe motions fail; and with them, conception alſo. From thence it ariſes, that girls of pleaſure ſeldom become pregnant: becauſe the *uterus* in them, in conſequence of having felt too much, feels nothing; or at moſt but little. It is, alſo, this, which occaſions thoſe men, who, from a deſire of having children, ſtrive for it with too much eagerneſs, to ſucceed worſe than thoſe, who give time to their women to have deſires, and wants.

VII. It is requiſite, that the *corpora fimbriata* of the Fallopian tubes; or at leaſt, of one of them; be brought cloſe to the *ovarium*; keep the *ſemen* applied to it; and give time to ſome of the ſeminal worms, to penetrate into an *ovum*, to fecundate it. This contraction of the *corpora fimbriata*, which brings them cloſe to the *ovaria*, depends on the action, which the *ſemen* has on the *uterus*, in the ſame manner, as the motions, of which we have ſpoken in the preceding

ceding article; and is performed by the ſame laws. If it happens then, that the action on the *uterus* ſhould not be ſufficiently ſtrong, the *corpora fimbriata* will not be applied to the *ovaria*; or will be unduly applied: the conſequence of which will be, that the *ſemen* will be loſt in the *abdomen*; and there will be no conception. The ſame caſe may happen, even by the faultineſs of the *corpora fimbriata*; if they be too much relaxed, too long, or too callous, in conſequence of a *ſchirrhus*; which hinders them from embracing the *ovaria* properly, whatever ſenſibility there may be in the *uterus*.

VIII. It is neceſſary, that the *ovaria* be free from any diſeaſe, and in a natural ſtate, in order that the *ova* may grow there; and arrive at the requiſite maturity. Therefore conception muſt fail, whenever the *ovaria* are diſordered, ſchirrous, ulcerated, ſteatomatous, dropſical, or covered with hydatids: and obſervations have always confirmed this fact.

IX. It is neceſſary, that one of the ſeminal worms paſs through the coats of the *ovaria*, to arrive at the *ovum*. I ſuppoſe, that this coat is perforated with an imperceptible nich, above each *ovum*: which, in proportion as the *ovum* grows larger, dilates itſelf gradually, till the *ovum* be capable of receiving the worm. It is eaſy to conclude from thence, that if this nich do not dilate ſufficiently; either becauſe it is naturally too little; or becauſe the coat of the *ovarium*, being too denſe, does not give way ſufficiently; the worm will not enter; and conception, therefore, fail. It muſt be confeſſed, that this is intirely hypothetical; and that a thouſand obſervations have not given any light to it; but it is ſo conformable to the ſtructure of the parts, that the belief of it is not eaſily avoided.

X. It is requiſite, in order for conception, that a worm enter into an *ovum*; and conſequently, that it find an *ovum* large enough to receive it; and ſuch as

ſuch as is perforated, at the proper place, with a hole ſufficiently big to admit its entrance: whence conception muſt fail, if there be not, in the *ovaria*, any *ovum*, which has attained to a ſufficient magnitude. This happens, therefore, in young girls, who are as yet ſcarcely arrived at the age of maturity. But I do not believe it ever happens in thoſe, who are paſt it. It may be the caſe with reſpect to the latter, when they are barren, that the *ova*, although they be mature, may be perforated only with a hole, that is too ſmall to receive the worm, which ſhould fecundate them: and, in ſuch circumſtances, there will be no conception. This is, indeed, only a mere conjecture: but we ſhall ſee below, that it is a very plauſible one.

XI. It is neceſſary, that the *ova*, to be capable of being fecundated, muſt be free from diſeaſe, clear, and tranſparent, as they are generally found in the *ovaria*. But ſometimes, nevertheleſs, they are found out of form, turbid, opake, yellow, brown, or ulcerated; as may be proved by a great number of obſervations: and, in theſe caſes, there is never any fecundation. It is neceſſary, likewiſe, that the *ova* be full, ſmooth, and plump; as they are in youth: and from thence it reſults, that women, who are advanced in age, do but ſeldom conceive; and, at laſt, do not conceive at all: becauſe, with age, the *ova* begin to ſhrivel; and are at length intirely ſhriveled: as has been obſerved.

XII. Laſtly, it is requiſite, that the fecundated *ovum* ſhould be conveyed into the *uterus*, by one of the Fallopian tubes, without ſtaying in the *ovarium*; getting out of its way into the *abdomen*; or being detained in the Fallopian tube: as ſometimes happens, according to what we have ſeen in the preceding chapter. It muſt be allowed, that in this caſe, a real conception is performed: but it does not produce a pregnancy; nor accompliſh the end of generation.

If

If all theſe ſeveral cauſes, we have here enumerated, be conſidered, ſome will be found, which may render conception more rare, or more difficult; but do not hinder it abſolutely: and I thought it proper to obſerve ſo. But there are only a few of this kind: the greateſt part are abſolute cauſes of barrenneſs: and are, therefore, really correſpondent to the object here propoſed.

## *Cauſes of relative barrenneſs.*

Relative barrenneſs is that, which happens to a woman with reſpect to one man; and does not happen to her with reſpect to another. As, for example, when a woman has no children by a firſt huſband, who, nevertheleſs, has himſelf had ſome by another wife; and yet, having become a widow, and having again married, has children by a ſecond husband. All the phyſicians, who have written on the diſeaſes of women, have mentioned this kind of barrenneſs: and I have ſeen two examples of it; which appear intirely concluſive to me.

Formerly, they unanimouſly attributed this kind of barrenneſs, to the diſproportion betwixt the *ſemina* of the two ſexes: that is to ſay, to an occult quality, of which they could not give any juſt account. We are not, at preſent, much more enlightened with reſpect to it: and I confeſs, that the explanation, which I am going to give, is purely conjectural. But, at leaſt, it is intelligible; and cloſely connected with the moſt certain principles of generation: which renders it plauſible.

It appears to me, then, that this barrenneſs may ariſe from ſeveral cauſes.

1° The woman may have a *fluor albus:* which, without being corroſive, may be ſufficiently acrid to deſtroy the ſeminal worms of the firſt husband; ſuppoſing them to be naturally weak: which would hinder conception with this firſt husband: but which

which would not produce the ſame effect on the worms of the ſecond husband, that might be more vigorous: and with whom, therefore, ſhe would not be barren.

2° It may happen, that the little ſlits of the *ovaria*, and holes of the *ova*, through which the worms muſt paſs, in order to conception, may be too little in the woman. The conſequence of which would be, that the worms of the firſt husband, being large, could not paſs, nor conſequently fecundate any *ovum:* whereas the worms of the ſecond husband being ſmaller, and more nimble, might eaſily get through them.

3° The niches of the *ova* of the woman may be too large for the worms of the firſt husband, that may be ſmall: in conſequence of which, they would be toſſed about, without forming any adheſion to the cord; and conſequently periſh there: whereas the *ova* of the ſecond husband, which may be larger, might fill the nich; adhere to it; and fecundate the *ovum*.

They admit another kind of relative barrenneſs, which does not ariſe from the husband: but from the age of the wife. They cite, as an example of it, women, who have no children during ten or twelve years of marriage; but who have ſome at laſt, by the ſame husband, when they are older. If the fact be true, for there may be a great deal of illuſion with reſpect to it, they ſhould explain it by the ſame principles; or to ſpeak more properly, by the ſame conjectures.

1° If the woman have, in her youth, an acrid *fluor albus*, which deſtroys the ſeminal worms, this *fluor albus* may be corrected by medicines, which may have been given to her; or by her own age: and, in that caſe, the worms, being no longer deſtroyed, conception takes place.

2° It might be, that the ſlits in the coats of the *ovaria*, or the holes of the *ova*, were too ſmall in

this woman, as long as she was young, to suffer the worms to pass through; because, in youth, the parts are firm and plump: whereas, being become more supple and soft by age, these openings have given passage to some one of the worms which fecundated an *ovum*.

3° It may happen, that the worms of the husband, that while he is young, being larger, and better nourished, could not penetrate into the *ova*, may become smaller, when he is grown older: which renders them capable of gaining a passage into one of the *ova* to fecundate it, without the necessity of supposing any change with regard to the woman.

## SYMPTOMS.

Barrenness has not of itself any symptoms, which are peculiar to it: which is no matter of wonder: since, in barrenness, the destroyed function, that concerns the propagation of the species, does not concern in any degree the preservation of the individual: nevertheless, fatal symptoms sometimes happen in barren women: but these symptoms take their rise from the causes, which produce the barrenness; or from the consequences of the imprudence of barren women.

I. It has been above shewn, that the *fluor albus*; or simple carcinomatous ulcers of the *uterus*; the suppression of the *menses*; schirrhusses of this part; too great heat; or relaxation, and inactivity of the *uterus*; often give rise to barrenness. In such cases, the barren women are subject to the symptoms these causes may produce; and of which we have spoken above in its proper place. The same may be said of abscesses, schirrhusses, and hydatids of the Fallopian tubes, and *ovaria*: of which, we have explained the nature and symptoms.

II. Excepting these cases, barren women enjoy good health; and may regard themselves as more happy

happy than fecund women, as they are not expoſed to the inconveniences and hazard of pregnancy, and its conſequences, if they could make themſelves eaſy. But the greateſt part, urged by a ſtrong deſire of having children, give themſelves up, with infatuation, to all the remedies, which empirics, women who pretend to ſkill in medicine, midwives, or nurſes of ſick people, adviſe them. For they are the perſons, whom they generally conſult: becauſe ſuch perſons moſt flatter their hopes: and they often become the victims of this unfortunate advice.

## DIAGNOSTIC.

I. There is no great occaſion to examine women, in order to know if they be barren. They are the firſt to expreſs their concern on that account. But formerly it was made a great point in practice, to know, whether the barrenneſs were curable, or not. There had been invented, even to madneſs, many applications on the loins or *vulva*; and many introductions of remedies into the *vagina*, which were believed to be infallible. But theſe remedies are not fit to be mentioned: being ridiculous in practice; and, what is ſtill worſe, perfectly uſeleſs, and deſerving to be put into the great number of frivolous practices formerly received. As I have never ſeen them practiſed by any body, I do not think it incumbent on me to enumerate them. But if any perſon be curious with regard to them, they have nothing to do, but to conſult ſome treatiſes on the diſeaſes of women, publiſhed about eighty or ninety years ago; and they may be certain of finding them there.

II. If the diagnoſtic of the diſeaſe be always eaſy, that of the cauſe is often very difficult. The cauſes of barrenneſs may be diſtinguiſhed without trouble, when the barren woman has a *fluor albus*,

copious, and acrid; when she has a simple, or a carcinomatous ulcer in the *uterus*; when she has the *uterus* obstructed, or schirrhous; when there is reason to believe, that she has the *uterus* too hot, from the heat which she feels in the entrails, the bilious and burning urine which she makes, or the vivacity of her constitution, &c; when, on the contrary, the urine is clear and serous, and the coldness of her constitution evinces that her *uterus* is lax, and inactive; and when there are no *menses*, or there is a continual uterine hæmorrhage. It may be easily judged, in all these cases, what is the cause of barrenness: and it is never then neglected to accuse the disease, which is distinguished. The disorders of the *ovaria* may be added to these, when the pain, which is felt in them, or the largeness and resistance which are found there, evince their bad state. But, however, no-body ought to flatter themselves with being able to distinguish, whether the cause of barrenness arise from the orifice of the *uterus*'s being stopped up, from the Fallopian tube's not being open into the *uterus*, from the *ovaria*'s being diseased with steatomas, schirrhusses, abscesses, or hydatids; or from the *vesiculæ* or *ova* being depraved, hard, full of a corrupted lymph, &c. But for what purpose do we seek to distinguish these several causes, to which we may, with reason, attribute the barrenness; when there is no other apparent cause: since it is certain, that all of them are equally incurable.

## PROGNOSTIC.

I. It has been already intimated, that there are not any symptoms peculiar to barrenness; from whence it may be easily concluded, that it is not of itself attended with any danger. We therefore see many barren women, who live to a good age, without any disorder. The example of nuns is a proof of

of this: for they are not ſubject to any diſeaſes different from thoſe of other women out of convents: notwithſtanding the ſeverity of their vows; and the auſterity of their rules.

II. Barrenneſs may ſometimes have fatal conſequences with relation to the cauſe on which it depends. For inſtance, if it proceed from a very acrid *fluor albus*; from an ulcer, cancer, or *ſchirrhus* of the *uterus*; from a ſuppreſſion of the *menſes*, or a conſtant hæmorrhage from the *uterus*; or from any diſeaſe of the *ovaria*; it will be attended with all the danger peculiar to theſe ſeveral cauſes; which danger may be of a fatal nature.

III. The ſame may be ſaid, if a barren woman imprudently truſts to hazardous medicines, adminiſtered by ignorant perſons. Theſe remedies are generally very heating, and fiery; becauſe thoſe, who give them, endeavour to excite a warmth in the conſtitution, which they believe to be cold: or they conſiſt of violent emmenagogues, to bring back the *menſes*, which fail. The common effect of theſe medicines is to cauſe a ſpitting of blood; to excite a flooding; to produce an inflammation of the bowels, or an ulcer in the *uterus*; and to throw the miſled patient into the greateſt danger.

IV. There are ſome kinds of barrenneſs, of the cure of which hopes may be entertained. Such are thoſe, that depend on the *fluor albus*; a ſuppreſſion of the *menſes*; an habitual flooding; or too great heat, and relaxation of the *uterus*: becauſe theſe diſorders may, and often are, cured. As to the other cauſes, they are incurable: and a prudent phyſician ought never to give too much hopes in ſuch caſes.

## *Method of cure.*

What has been ſaid above, reduces into a ſmall compaſs, what is to be propoſed, as to the method of cure of barrenneſs.

I. In the barrenneſs, which proceeds from the *fluor albus*; an ulcer; a *ſchirrhus*; a cancer; obſtructions of the *uterus*; a ſuppreſſion of the *menſes*; or a conſtant flooding; it muſt be endeavoured to cure theſe ſeveral reſpective diſeaſes; and, in order to that, what has been ſaid above on each of theſe particulars muſt be conſulted.

II. The ſame may be laid down, as to the diſeaſes of the *ovaria*; of which we have ſpoken above. It is true there is not, with relation to them, any effectual help: but there will be found, in the place referred to, an account of all the help, which is to be had.

III. It is in vain to try to cure the barrenneſs, that is cauſed by the cloſed ſtate of the orifice of the *uterus*; by the ſtoppage of the Fallopian tubes; or by the *ovaria* or *ova* being diſordered or corrupted. There is not hitherto any means of remedy known: and the beſt way is to attempt none.

IV. All then, that remains to be done in this chapter, is to ſhew the treatment, which is proper in the two oppoſite caſes, that often cauſe barrenneſs. The one, when the *uterus* being too hot, deſtroys the ſeminal worms: and the other, when being too weak and lax, it does not contract ſtrongly enough in the act, to force the ſeminal fluid into the Fallopian tubes, and thence into the *ovaria*. This buſineſs will be diſpatched in the two following articles.

## *Of the treatment which is proper, when the* uterus *is too hot.*

1° As the too great heat of the *uterus* only proceeds from the too great quantity of blood, which is carried thither, bleeding is employed, as the moſt effectual remedy, to diminiſh this redundance. It is repeated, accordingly as the ſtate of the pulſe indicates; and it ſhould be always in the arm: ten ounces of

of blood being each time taken, if the patient be young, and of a florid colour.

2° If it be in the ſpring time, broth made of a chicken, or of a bit of veal, ſhould be taken; and in it ſhould be boiled, for half an hour, an ounce of the roots of purſlain; and half an ounce of the roots of water-lilly; and, for a quarter of an hour, a handful of the leaves of lettuce and ſorrel. The broth, being ſtrained, a dram, or half a dram of chryſtal mineral ſhould be diſſolved in it. This broth ſhould be continued for fourteen or twenty days.

3° After the broth may be taken a pint, or a pint and half of whey, made with preſſure, and filtered through paper; which ſhould be drunk, a month, in the morning faſting, at two or three times, with the ſpace of about an hour betwixt them. It would be well to add, to this pint of whey, an ounce, or an ounce and half, of the ſyrup of water-lilly.

4° Advantage muſt be taken of the ſpring, to drink aſſes milk: which is the moſt certain remedy, when the ſtomach will digeſt it. A cup of about eight ounces may be taken at firſt: which may be augmented gradually to twelve ounces. And, if this appear to ſucceed, the ſame quantity may be taken, after ſome days, in the evening, at going to bed: and this practice may be perſevered in for a long time. It is proper, in this caſe, to drink the milk, while it is new; and to keep the belly a little open, but gently.

5° In the ſummer, the patient ſhould bathe, and drink mineral waters. The bathing ſhould be every month in the ſummer, for twelve days each month. The baths ſhould be gently warm; and there may be boiled in them, if it be choſen, ſome handfuls of the bears-breech, or of mallows. The patient ſhould ſtay an hour and half, each time, in the bath: and, as this ſhould be in the morning, a pint of the whey, or of the chicken broth, as has

been noted in N° 2 and 3, may be given during that time.

6° With regard to the mineral waters, they may be taken only for fifteen days together: but the uſe of them muſt be repeated ſeveral times in the ſummer; as well as the bathing. Thoſe waters muſt be choſen, which are acidulous, light, diuretic, and impregnated with only a ſmall proportion of iron. Thoſe of Forges, in Normandy, are much eſteemed: but the waters of this kind, are common every where. A pint and a half may be drunk in general every day, and to render them a little purgative, there may be diſſolved, in the two firſt glaſſes, a third, or the half, of a paper of ſal polychreſt, or the *ſelle de ſeignette*, or vegetable ſalt.

7° It will be doubtleſs underſtood, that the patient ſhould be purged from time to time, during the courſe of this treatment; particularly in the going from one remedy to another. Theſe purges are to be gentle; ſuch as the following. Let an ounce and half of tamarinds be boiled in twelve ounces of water, during half an hour. In the filtered fluid, infuſe a dram of the follicules, and a dram and a half of the vegetable ſalt, for a night. In the morning, add two ounces of manna: after which the medicine muſt be ſtrained, in order to be taken.

8° The regimen muſt be temperate, and cooling. The food ſhould be veal, young fowls, and rabbits: avoiding mutton and beef. Spoon meat, made of rice or *ſimoule*, ſhould be eaten twice a day. An abſtinence muſt be obſerved from ſoop, ſalt proviſions, ſpice, ragouts, pies, wine, coffee, and ſpirituous liquors. The common drink ſhould be, an infuſion of maiden hair. The patients ſhould be adviſed not to fatigue, or heat themſelves: but to keep quiet. Clyſters ſhould be frequently given them, with whey; in which ſhould be diſſolved a dram of chryſtal mineral. Laſtly, they ſhould be directed,

ed, to lye in a ſeparate bed from their huſbands, for at leaſt ſix months.

## *Of the treatment which ſhould be obſerved when the* uterus *is cold, and relaxed.*

The method to be employed in this ſtate, is directly contrary to that, we have before propoſed in the preceding caſe.

The intention here is, to diſcharge, by urine, or perſpiration, the ſerous humour, which relaxes the fibres of the *uterus:* and to endeavour, by ſuch means, to reſtore their elaſticity; and give them the requiſite firmneſs, and ſenſibility: and, at the ſame time, to render the humours, which come from the *uterus*, *vagina*, *proſtatæ*, and Cowper's glands, thin, fluid, and active; as they ought to be, in order to cauſe wants, and excite proper deſires. To effectuate this intention, the following remedies are generally uſed.

1° In temperate ſeaſons, ſhould be given broths with craw-fiſh, wood-lice, and even vipers, made with a fowl, or half a pound of veal; to which is added, towards the end of the boiling, roots of parſley, or eryngo, and round or long birth-wort, each half an ounce; leaves of fumitory, chervil, water-creſſes, and even rue, each half a handful. In ſtraining theſe broths, thirty grains of *terra foliata tartari* ſhould be added to each. It would be well, if convenience permitted it, to make theſe broths in *balneo mariæ* in a tin box, where the cover cloſes with a joint, or, at leaſt, in a pot where the cover is fixed on cloſely by rolls of thick paper, that nothing may eſcape. The uſe of theſe broths ſhould be continued twenty days.

2° In the place of theſe broths, may be given, if it be judged proper, a ſudorific ptiſan, with the common roots, and woods; gum guaiacum, and ſaſſafras raſpt; ſarſaparilla bruiſed; and ſquills cut into ſlices.

ſlices. Theſe drugs may be uſed in greater or leſs doſes, or may be boiled in a greater or leſs quantity of water, accordingly as it is deſired the ptiſan ſhould be more or leſs ſtrong: and one or two glaſſes a day is generally given. It is either rendered purgative, or taken without purgatives, according to the ſtate of the patient. The uſe of this remedy ſhould be continued, for three weeks, or a month.

3° The patient ſhould be ſent to warm mineral waters, in the proper ſeaſons, which are the ſpring and autumn, in order to drink them; bathe in them; be fomented on the loins with them; and receive the vapour into the *vagina* by means of a tunnel: or, what is leſs troubleſome, and more efficacious, to make injections into it of the water moderately warmed. The uſe of each of theſe remedies requires particular precautions; with which, the phyſicians, who attend the baths, or, in default of ſuch, the perſons who keep them, are informed. It is proper to take care, not to crowd theſe ſeveral remedies together; that is to ſay, not to employ them all at once; but to give each in particular a ſufficient time; in order not to be fatigued with the uſe of them.

4° The food ought to be of a warm nature; as far as may be agreeable to the conſtitution. It is proper, therefore, to ſuffer the patient to eat things that are ſalt and ſpicy, high-taſted ragouts, truffles, muſhrooms, pyes, hams, and high-dreſt diſhes. They ſhould be even directed to do this, if their ſtomach will bear it. They ſhould be alſo ſuffered to drink wine; and particularly ſuch as is cordial: and they may be permitted even to drink a little ſpirituous liquor; as likewiſe chocolate, and coffee. They ſhould be made to uſe as much exerciſe as they can on foot; and, at all adventures, in a carriage: and clyſters ſhould be frequently given them, with a decoction of the leaves of mug-wort, mother-wort, birth-wort, white horehound, and even of rue.

5° If

5° If these means have not the effect, which is desired, the last step to be taken is, to use the remedies proper to excite wants, and even desires, known under the name of *Aphrodisiacs*. Among these medicines, there are some, which are very hot, acrid, and truly incendiaries; which are to be avoided. There are several also, that have no virtue, but what ancient prejudice has bestowed on them. But we shall enumerate here only those, which are moderate, and of known efficacy.

Amongst the first are reckoned pistachios, and kernels of pine-apples, of which biscuits are made; balsam of Capivi, in the dose of four or five drops, rolled in sugar, taken twice or three times a week; opium, or laudanum, in the dose of a grain, taken in the evening, at going to bed.

There may be put in the number of those, though they are somewhat more active,

The roots of eryngo, and of satyrion, } preserved, in any dose from half a dram to a dram.

Nutmeg preserved; nearly in the same dose.

The seeds of garden-rocket, of meadow-cresses, of garden-cresses, of common hart-wort, of bishop's weed, of eryngo, } In the dose of twenty grains; if two only of them be employed: but half that quantity, if several of them be taken.

Of which may be made boluses, troches, or opiates, with syrup of kermes, mug-wort, or balm.

Moreover in the treatment, which is used in cases, where it is believed the barrenness proceeds from a relaxation, or coldness of the *uterus*, two intentions should be had in view. The *first* is, not to employ too hot remedies; for fear of injuring the viscera, and

and particularly the breaſt. Nothing is more common than to ſee ignorant empirics, who beat down the blood of the patients, and throw them into conſumptions, by giving them inflammatory remedies, to remove their barrenneſs.

The *ſecond*, that whatever attention there be to employ moderate remedies, the uſe of them muſt be diſcontinued for ſome time, as ſoon as the inefficacy of them appears; becauſe it is very apparent, in this caſe, that the barrenneſs proceeds from a cauſe abſolutely incurable.

Many remedies, recommended by the ancient phyſicians againſt barrenneſs, have been thought proper to be exploded: as being abſurd, inefficacious, and ſuperſtitious. Such are,

The umbilical cord, And the after-birth, } dried; and powdered in the doſe of ℥j.

The *uterus* of a doe, of a ſow, of a hare, } dried; the ſame doſe.

The teſticles of a fox, of a wild boar, of a ram, } dried; and the ſame doſe.

The fleſh of the loins of Scinck, dried; in the ſame doſe.

The penis of a bull, of a ſtag, } dried; in the ſame doſe.

Raſpings of ivory, in the ſame doſe.

The liver and teſticles of a ſucking pig, fricaſſeed, and eaten, in the ſame doſe.

The opinion, which was held of ſuch remedies, and the earneſtneſs with which they were propoſed, were conſequences of the credulity, that formerly reigned in medicine; and of the cuſtom, which prevailed,

vailed, of compiling blindly, and without examination, all that was found in the antient books.

## CHAP VII.

### *Of pregnancy.*

WE have seen above, in Chapter III. that the *ovum* fecundated by the introduction of a seminal worm, detached from its *cellula*, received by the *corpus fimbriosum* of the Fallopian tube, and gently pushed along that duct, falls at last into the cavity of the *uterus*, disposed to receive it: that is to say, in other words, we have seen the mechanism of conception. Occurring questions, which it was proper to discuss, have interrupted the continuation of this subject: but it is time to recur back to it: and to examine how this *ovum* unfolds, enlarges, and becomes a *fœtus:* that is to say, how pregnancy must be explained. In doing this methodically, three questions arise, 1st, How the *ovum*, and afterwards the *fœtus*, unite themselves with the *uterus:* and what is the situation, they maintain in it. 2dly, What is the nourishment, which the *fœtus* obtains there: and by what way it receives such nourishment. 3dly, What is the progress of its growth; and the order in which its parts are unfolded.

#### § I. *Of the adhesions of the* fœtus *to the* uterus; *and the situation in which it is there.*

The fecundated *ovum*, falling from the end of the Fallopian tube, is received into a spherical cavity formed by the contraction of the *uterus*; and full of a milky lymph, which the vermicular vessels have furnished, for the reasons advanced in Chapter III. It may be well supposed, that this milk could not run out

out through the orifice of the *uterus*, which is then closed: as was also observed in the same place.

As the spherical cavity, which the contracted *uterus* leaves, is much larger than the *ovum*, the *ovum* must necessarily swim there without any adhesion to the *uterus*. It is not known, how long this state continues; for no experiments can be made, that will determine it: but it is conjectured, to be about the space of a month. There are animals, such as mares, in which this state remains during the whole of the pregnancy, without the *fœtus*'s being ever affixed to the *uterus*.

While the *ovum* floats thus in the *uterus*, it is so placed, that the *placenta* is uppermost; as being the lightest part of the *ovum*. The same would happen, if a piece of cork was fastened to a small bit of lead; and they were put to float in water, the cork would always be the uppermost.

In this situation, the part of the *ovum*, which forms the after-birth, increasing from day to day with great quickness, the *placenta* is strongly pushed against the *uterus*, so that the eminences, which are on its exterior surface, are buried in the substance of the *uterus*, which is become pulpous since the time of conception: and the substance of the *uterus* presses by its sides, buries itself, in its turn, in the furrows of the *placenta*; in such manner, that, by these mutual insertions, and the contact of the *placenta* with the *uterus*, which is always increasing, as the after-birth increases, the *placenta* gains a strong adhesion.

As it has been already observed, that the *placenta* is uppermost in the *uterus*, it follows, that when the adhesion is made, it must be in the superior part of the *fundus*: and that is, in reality, the place where the *placenta* does most commonly adhere; and which is most suitable to keep the after-birth suspended in the *uterus*; and hinder it from falling on the orifice: and, likewise, the most commodious place, as will in proper time be observed, for facilitating delivery.

It

It muſt be allowed, it does not always happen to be in the part of the *uterus* directly oppoſite to the orifice, that the *placenta* adheres: becauſe the *uterus* is not always in a ſtreight ſituation: but for the greateſt part, more or leſs inclined to the right or the left. If it be inclined to the right, the *placenta*, which ſhould adhere to the higheſt part, will adhere a little to the left: and, if the *uterus* be inclined to the left, it will adhere a little to the right. Moreover, in women, who keep in bed, or reclined on a couch, for fear of any hurt, the *placenta* will adhere towards the anterior part. But theſe trivial exceptions do not hinder it from being true, that the *placenta* adheres always to the *fundus* of the *uterus*, as much as its uſual poſition will admit.

This firſt adheſion of the *placenta* is ſufficient to ſupport the after-birth, and the *fœtus*, ſo long as they are ſmall: but it is evident, that it would not be ſufficient towards the third month of pregnancy, when they have acquired a certain magnitude, and weight: and nature has made proviſion accordingly. At that time, the *placenta*, bearing more ſtrongly againſt the *uterus*, compreſſes more forcibly the uterine veins, in the part where it adheres; and conſtrains more forcibly the courſe of the circulation; which occaſioning the blood to ſtop there, it dilates thoſe veins to that degree, in which we know they are dilated in pregnancy. The direct paſſage of the blood being thus obſtructed, it muſt turn into the lateral veins, or cœcal *appendices*; ſwell and elongate them, ſo as to make them project into the *uterus*; and force them to form niches in the cellular ſubſtance of the *placenta*. We ſhall ſee, in the next article, that theſe veins, in opening, diſcharge their blood, for the nouriſhment of the *fœtus*. It is ſufficient, therefore, to remark here, that the blood, which they do diſcharge into the *cellulæ* of the *placenta*, ſwells them; and, at the ſame time, the ſubſtance of the *placenta*: which, by this means, embraces more forcibly the

cœcal

cœcal veins; and makes a ſtronger adheſion, that continues during the whole of pregnancy.

As long as the *placenta*, by its ſucceſſive adheſions, holds the after-birth firm in the *uterus*, the *embryo*, which, being ſuſpended by the cord, ſwims in the lymph contained in its membranes or coverings, takes ſucceſſively the ſituations proper to its ſtate; which is effected by mechanical cauſes. At firſt it is placed perpendicularly with its head uppermoſt, towards the *placenta*; which reſults from the laws of ſtatics; becauſe the head is lighter than the reſt of the body; and the breaſt being hollow, is yet more ſo.

There may perhaps be ſome reaſon, to wonder at this propoſition with regard to the head: becauſe, being very large in the *embryo*, and *fœtus*, it ſeems to weigh ſo much more than the lower parts of the body, that are ſmall. But theſe parts, however ſmall they may be, are ſolid; and muſt conſequently weigh more than the head; though that be bigger; becauſe there is, in the head, and particularly in the large heads of *fœtuſſes*, many cavities at the ears, eyes, and noſtrils; and the brain which fills the inſide of it, is very much rarefied, and conſequently light.

The *embryo*, therefore, ſuſpended by its cord, floats in the water of the after-birth, with its head always higheſt; and may turn itſelf on all ſides as long as it is little; and not preſt by the *uterus*: but this liberty ceaſes, when it becomes bigger; becauſe the *uterus* confines it. The ſpine of the back bends forwards; and the head inclines the ſame way. The thighs and the knees are obliged to fold, in ſuch manner, that the heels almoſt touch the buttock, and the knees the chin. The arms are bent ſometimes towards the head, and ſometimes towards the ſides, in ſuch manner, that the *fœtus* is rolled up like a ball: which adapts itſelf to the cavity of the *uterus*.

What merits moſt to be remarked, is, that, in this ſituation, it is neceſſary, the back of the *fœtus* ſhould be turned againſt the back of the mother; and its

its face againſt her belly. This is the only poſture, which is proper for it: and the only one it can take. It is, likewiſe, the only one, that it keeps during the reſt of pregnancy: on which account the women deceive themſelves in believing, that the child plays in their bellies; and turns itſelf ſeveral different ways. The only motions which it can have, and which it has in effect, are confined to the moving its knees or thighs aſunder, to the raiſing its head a little; and to ſometimes ſtretching itſelf out lengthwiſe.

## § II. *Of the nouriſhment of the* fœtus; *and the ways by which it is conveyed.*

It is certain, that when the *ovum* is fecundated, there is a reciprocal circulation betwixt the *embryo*, and after-birth. To what purpoſe, otherwiſe, would be the union betwixt them; and particularly, an union by two arterial veſſels proper to carry the blood from the *embryo* to the after-birth, and one venal veſſel proper to carry it back from the after-birth to the *fœtus*. It is certain, however, that this circulation cannot be made in any manner, nor is made, till after the *embryo* be conjoined with the umbilical cord: nor till after its umbilical arteries be opened into the arteries of the cord; and the vein of the cord, in the like manner, into the umbilical vein of the *embryo*.

From theſe two facts, which cannot be conteſted, may be drawn many important conſequences.

1° That before the conjoining of the ſeminal worm with the *ovum*, there was no circulation in the veſſels, which belong to the *ovum:* becauſe there was no motive force in it capable of producing ſuch a circulation: and the arteries and umbilical vein, through which it muſt have been made, did not communicate with each other. At that time, the *ovum* was nouriſhed by the circulation of

blood and lymph, which were formed in the mother; as the other parts of her body were. It is neceſſary only to ſuppoſe, that the veſſels of the *ova*, which are, in the future, intended to ſerve for the circulation betwixt the after-birth, and the *embryo*, were full of a lymph, that hindered them from being obliterated: which happens to all the veſſels of the body when they are empty.

2° That, with regard to the ſeminal worm, which forms the *embryo*, there is in it, before any union with the *ovum*, and from its firſt origin, of which I acknowledge myſelf ignorant, a real circulation: ſince the worm was alive; and could not be ſo without circulation. The circulation, which ſubſiſted in this worm, was the ſame as that which is in the *fœtus*, and the human creature itſelf: ſince this worm is a human creature, with the difference, that, as there is no reſpiration in the worm, and the lungs have no function in it, the Author of nature has eſtabliſhed a peculiar circulation there, by making paſs a part of the fluid of the right auricle, into the left, by the *foramen ovale*, and turning into the *aorta*, by the arterial canal, the greateſt part of the fluid propelled into the pulmonary artery, to prevent the repletion which would be made in the lungs, on account of their want of action. This order of circulation is found in all new-born fœtuſſes; although the uſe of reſpiration, which they have, has rendered it of no further conſequence. It is proper only to obſerve, that the portions of umbilical veſſels, which the worms have, were full of a fluid, to keep them open; though they were not as yet ſubſervient to the purpoſes of circulation.

3° That this circulation which is in the worm before it be joined with the *ovum*, and which after the joining is betwixt the worm and *ovum*, is a circulation of pure lymph, ſuch as that in all inſects, and

and all the animals, in which no blood is found; and which are for that reaſon called *exanguia*.

4° That what has been ſaid, ſerves to account for the *punctum ſaliens*, or that red point, which contracts and dilates itſelf, as has been obſerved in chickens which have been ſat upon for ſome time; and which, there is reaſon to believe, is, in the ſame manner, in all embryo's. Every body allows, that it is the heart, which beats; but it is believed, that the heart of the chicken only begins to beat then: whereas it is certain, that it beats before the incubation; and even before the ſeminal worm of the cock was joined to the *ovum* of the hen: but it could not be perceived, till the red colour of the blood, of which it is then full, rendered its motion perceivable.

In this light, neither the embryo's, nor the coverings which contain them, change their nouriſhment in the beginning of pregnancy. Fallen into the *uterus*, and ſwimming there in the milky lymph, which is collected in it, according to what has been ſaid in chapter III. the *embryo* is nouriſhed in the ſame manner as a plant is in a pot full of earth. As the juice of this earth penetrates into the pores of the roots of the plant, and is diſtributed afterwards throughout the whole of the plant; ſo the lymph penetrates into the *cellulæ* of the *placenta*, and from thence is carried into the body of the *embryo*, by the umbilical vein. Nothing can be more moderate than this nouriſhment: the lymph introducing itſelf into the *cellulæ* only by its fluidity, without being impelled. While at the ſame time nothing is more light: as this lymph is extremely ſerous: though nothing could be better adapted to the ſmallneſs and ſoftneſs of the body of the *embryo*.

In proportion as the *embryo* grows larger, a more abundant and ſucculent nouriſhment becomes neceſſary to it: and the Author of nature has accordingly provided it.

At this time, the *placenta* affixes itſelf to the *uterus*, as we have ſeen in the preceding article; and by that means, it receives the uterine milk immediately from the vermicular veſſels: and, with that impulſive force which the beating of the uterine arteries, and the elaſticity itſelf of the *uterus* can give it. It receives the lymph therefore more abundantly: and, at the ſame time, the lymph itſelf is more ſucculent; becauſe it is more milky.

This does not happen till about the ſecond month of pregnancy: and then the *menſes* have already failed twice. The *menſes*, being retained, augment the quantity of blood; and, by that means, render the ſanguification, or converſion of chyle into blood, more ſlow: becauſe the blood is leſs attenuated, when the veſſels are too full. The chyle will, therefore, preſerve its form longer in the blood: and in conſequence of circulating under this form, it is more copiouſly mixed with the uterine lymph, and renders it more chylous; or, what amounts to the ſame, more milky: which ſtill goes on augmenting, in the ſame proportion, during the whole courſe of pregnancy.

It is proper to obſerve, that the lymph of the breaſts, in pregnancy, partakes of the changes, which happen in the uterine milk. As theſe two humours are analogous; or, to ſpeak more properly, as they are the ſame; the chyle which regurgitates into the blood, till it joins with the uterine lymph, muſt unite in the ſame manner, with the lymph of the breaſts; and this humour, being become thicker, muſt ſwell the *veſiculæ* of the mammary body; and cauſe that ſwelling of the breaſts, which is perceived in the beginning of pregnancy; and continues to increaſe even to the end.

But this is not all: the Author of nature has provided the *fœtus* with a third kind of nouriſhment ſtill more ſtrong. This is the blood itſelf of the mother. It has been ſhewn before, that the preſſing of the

*placenta*

*placenta* againſt the *uterus*, forces the blood into the uterine veins; ſwells, and elongates the veinous *appendices*, which we have deſcribed in the firſt chapter; and which are branches of thoſe veins: that theſe *appendices*, by elongating, inſinuate themſelves into the cellular ſubſtance of the *placenta*: and that ſpreading themſelves there, they diſcharge the blood; which is carried into the *fœtus* by the umbilical vein.

I know, that theſe facts are denied; and that there is occaſion to prove them; but I defer doing this till in the following chapter. It is ſufficient to remark here, that the blood paſſes from the mother to the child in ſmall quantities, and ſlowly; that the *fœtus* may not be ſuffocated with it. In order to enable any to form a judgment of this, it is ſufficient to make them obſerve, that the veinous *appendices*, which diſcharge it into the *placenta*, come off from the uterine veins at right angles; which occaſions, that the direct courſe of the blood, in the canal of the vein, is neither diſpoſed to paſs in a great quantity, nor with rapidity: and, therefore, the blood muſt be carried into the *placenta*, to ſerve for the nouriſhment of the *fœtus*, for the reaſons, which have been above explained.

But to reſume what we have eſtabliſhed in this article. There was originally, in the veſſels of the ſeminal worms before conception, only a pure lymph, which circulates there. The ſame continued till the fecundated *ovum* got into the *uterus*; where, if the *embryo* received any thing, it was only ſome drops of the humour contained in the *ovum*. As ſoon as the *ovum* was in the *uterus*, the *fœtus* began to be nouriſhed by the milky lymph which was collected there. The nouriſhment was more copious the ſecond month of the pregnancy, when the *placenta* was conjoined with the *uterus*: and, afterwards, it was ſtill more full and perfect, when the veinous *appendices* diſcharged the blood of the mo-

ther into the *placenta*, to be conveyed thence to the *fœtus* by the circulation.

## § III. *Of the progreſs of the growth of the* fœtus *during pregnancy; and of the changes, which happen to it during the growth.*

It is univerſally known, that the *fœtus* grows much in the womb of its mother: but no-body has, perhaps, reflected to what degree that growth goes. Leewenhoek and Hartſoeker ſpeak of the million of worms in the ſmalleſt drop of the *ſemen*. They are infatuated with their diſcoveries; and the enthuſiaſm leads them to exaggeration. I have myſelf ſeen theſe worms, and very diſtinctly: but, although very numerous, I did not ſee them in ſuch vaſt multitudes, as thoſe gentlemen have related. I can, nevertheleſs, take upon me to aſſert, that a thouſand of them would not weigh a grain.

Nevertheleſs, the worm, which was only an atom, becomes in nine months a *fœtus*, weighing fourteen or fifteen pounds: that is to ſay, one hundred and thirty-eight thouſand two hundred and forty grains. If this worm weighed a grain, the increaſe would be very large, from 1 to 138240: but by ſuppoſing, that it weighs only a thouſandth part of a grain, the increaſe, which is from 1 to 138240000, is truly immenſe; and, nevertheleſs, very real.

The progreſs of this growth is not equal, and uniform, during the whole time of pregnancy. It is very great the firſt month; leſs the ſecond; and thus diminiſhes gradually, even to the ninth. The ſame diminution is obſerved in the growth of children after their birth. They grow much the firſt month; leſs the ſecond; and always after gradually leſs, till the eighteenth, or twentieth year of their age, when they ceaſe to grow at all.

It

It is believed with reaſon, that, by ſuppoſing, the quantity of nutritious juice, and the force which propels it, equal, the quantity of the growth muſt be eſtimated by the ductility, or diſtenſibility of the parts; which make them yield eaſily to the introduction of the nouriſhing juice; that extends; elongates; and by that means, cauſes them to grow: whereas, when the parts, become hard to a certain degree, cannot give way to this expanſion, the nutritious juices may eaſily repair the breaches, which the atoms, that are ſeparated, leave. This is called *nouriſhing the parts*; but it cannot elongate their fibres; or, in other words, cannot make them grow.

Theſe principles are very conformable to experience. In a *fœtus* of a month, the ſoftneſs and diſtenſibility are very great: and the growth muſt be ſo likewiſe: the ſoftneſs and diſtenſibility diminiſh afterwards, from month to month: and the growth of the *fœtus* muſt be therefore leſs in proportion. This is verified in the ſame manner in children. Their parts are never ſo ſoft and diſtenſible, as in the firſt year of their birth: and that is the year, in which they grow the moſt. Theſe qualities diminiſh afterwards from year to year; and their growth diminiſhes the ſame, till it ceaſes, about the eighteenth or twentieth year. Becauſe then, the parts have acquired firmneſs enough, not to ſuffer themſelves to be any longer diſtended by the nutritive juice.

It is intirely otherwiſe with regard to the *placenta*; which diminiſhes in its volume in the courſe of pregnancy. It is larger in the *fœtus* of three months, than in one of five; and bigger ſtill in a *fœtus* of ſix months than in one of nine: apparently, becauſe, in the firſt months, it receives more of the nutritious juice that it furniſhes to the *embryo*; which ſwells its cellular ſubſtance more; whereas, in the laſt months, it furniſhes more than it receives; which empties its *cellulæ*; and contracts its volume. However it

may be, this diminution in the volume of the *placenta* is very uſeful: becauſe it facilitates its ſeparation from the *uterus* in the delivery at the time; and occaſions it to paſs out eaſily through the opening, which the *fœtus* has procured it: whereas being larger in the falſe conceptions, it is leſs eaſily ſeparated; and has often difficulty in paſſing even where the *fœtus* has paſſed.

While the *embryo* grows with ſo much rapidity in the *uterus*, ſurprizing changes happen in it. It is imagined, that the *embryo* is a little miniature; in which all the members are deſigned and perfect: and that it differs from a human creature, only in its ſmallneſs. This is at leaſt the notion, which the pretended Dalenpatius had of the ſeminal worms, in a Latin letter, inſerted in the * *Nouvelles de la Republique de Lettres, mois de Mai, article* v. *ann.* 1699.

He might have been eaſily pardoned, if he had given what he had ſaid only as a ſimple conjecture: but he ought not to be forgiven, having delivered it as a fact, which he had obſerved by the help of an excellent microſcope; and for having added figures, merely of his own invention, to repreſent and ſupport what he had advanced, by which means he impoſed on Mr. Antoine Valliſnieri †, who has quoted him with praiſe; and adopted the two figures, as we have already remarked elſewhere ‡. Such is the general conſequence of falſe obſervations: which are too common, in natural philoſophy and medicine.

Happily, that of Dalenpatius will not deceive

* The author of this letter was a man of genius at Montpellier, who travelled into Holland in 1699. He compoſed this letter in order to divert himſelf, as he ſaid. He called himſelf *Plantade*, in Latin *Plantadius*, of which *Dalenpatius* is an anagram. He died advocate general at the court of Aids at Montpellier.

† Della generatione dell' Uomo. *Part.* 1. *Capitul.* 2. *Artic.* 4.

‡ De Morbis Venereis. *tom.* II. *pag.* 1002.

any-

any-body, as the falſity of it is well known. Far from the ſeminal worm's being a well formed, little man, as he pretends to have obſerved, the *embryo* itſelf, which ſome days after conception is much bigger than the worm, is only a little *mucus* joined to a thread; which appears without form; and in which no configuration can be diſtinguiſhed.

Mr. Dodart *, had occaſion to examine an *embryo*, where he was certain the conception had gone to the twenty-firſt day. He found, that it was in length ſeven lines; and that it weighed a little leſs than ſeven grains; and conſequently was much larger and heavier than a worm in the *ſemen*. There was, nevertheleſs, no form but that of a trunk. "The thighs were not yet unfolded; they were "only two little warts, which appeared at the bot-"tom of the belly; the arms were two other little "warts, ſituated at the place of the arms. The "head was at leaſt a third of all this length of the "ſeven lines. Two little black points, which were "ſeen, would have been ſome time eyes; the mouth "was already very large. There did not appear "any eminence at the place of the noſe; only two "marks, like imperceptible hollows, foretold the "two holes of the noſtrils. The place of the "ſhoulder was of the greateſt dimenſions, as to "breadth; but were ſcarcely found to be four "lines."

Mr. Littre laid before the *Academy of Sciences* †, the ſame year, 1701, an obſervation yet more ſurprizing. He found, as he ſaid, in a fecundated *ovum*, which was ſtill in the *ovarium*, a *fœtus*, that was a line and half in breadth; and three lines in length: and was joined to the interior part of the membrane of the *veſiculæ*, or *ovum*, by a large ſtring, of a third of a line; and of the length of a

* Hiſtorie de l'Academie des Sciences, *ann.* 1701. *p.* 19.
† *Ann.* 1701. *p.* 112.

line.

line and half. He diſtinguiſhed very eaſily, as he aſſerts, in this *fœtus*, the head; and, in the head, an open part in the place of the mouth; a little eminence in the place of the noſe; and a little line on each ſide of the root of the noſe. Theſe two little lines were apparently, as he believes, the openings for the eye-balls. He perceived, likewiſe, on each ſide of the lower part of the trunk, an eminence, which was round; and of the bigneſs of a middling pin's head. He obſerved, moreover, on both ſides of the upper part of the trunk, an eminence, that was alſo round, but ſmaller than the others: in all probability, theſe eminences were the upper and lower limbs of the *fœtus*.

Ruyſch * relates ſeveral ſuch obſervations of embryo's, that were nearly of the ſame age; and of others older: but I conceive it would be uſeleſs to repeat them: as it is ſufficient to quote the places, where they may be found by thoſe, who are deſirous to conſult them.

An idea may be formed of the ſucceſſive changes of the *embryo*, from thoſe which happen in the generation of frogs. From the eggs, which they lay in great numbers, there comes, out of each, a little fiſh, that grows ſoon of the ſize of the little finger; and is remarkable for a great head, and a long tail; as the worms in the *ſemen*. They are called Τύρινοι in Greek; *tetards* in French; and *cabarles*, in ſeveral provinces, becauſe of their large heads. (*In Engliſh they are called tadpoles*). It is as difficult to know a frog in this form, as to know a man in the ſhape of a worm. But in a ſhort time, there be-

* Theſaur. Anatomic. VI, à N. xi. ad. N. lxii.

*Idem.* Adverſarior. Anatomic. *Decad.* II. *Art.* x. *p.* 28.

In which he ſpeaks thus: *Apparent nulli omninò artus in primo embryonis ſtatu. Poſtea verò in locis ubi humeri & femora deinceps apparebunt, tubercula modò exigua prominent, ex quibus poſt longum diem, humeri, brachia, manus, femora, crura, pedes, explicantur & prodeunt.*

gins

gins to appear, in these fishes, under the head, on the right and left, two little tubercles; which, by unfolding themselves, become the two fore legs; as has been remarked, that there are formed, in the *embryo*, two little warts, according to Mr. Dodart; or two little eminences, according to Mr. Littre; which become two arms. Immediately after them, there appear in these fish, on the right or left, under the belly, two other similar tubercles; that become two hind legs; which are longer in frogs than the fore legs. The same happens in the *embryo:* for two warts, or eminences, which appear at the inferior extremity on the right and left, form the two legs: which are longer than the arms. Moreover the tail, which would have disfigured the frog, diminishes in like manner, as the tail of the seminal worm disappears in pregnancy. This comparison, which seemed necessary to me, in order to make known the order of the changes, which are found in the *embryo*, may give disgust to those, who are capable of imagining a more noble origin. But I am very glad to have rectified their notions, and made them comprehend, that, notwithstanding the excellence of our nature, our origin is*, in fact, the same with that of the most insignificant animal.

Dalenpatius was mistaken, as we have before proved, in believing, that the apparent conformation of the seminal worms, and much less that of embryo's, was the same as that of men: and he was not less wrong in advancing, that he had the pleasure to see one of these worms putting off a skin, which disguised it, in order to throw itself under its natural form. It is true, that this change of skin is common in many insects, in their *metamorphoses*. In this manner, the silk-worm leaves a skin

* Pudet atque etiam miseret æstimantem, quàm sit frivola animalium superbissimi origo. Plin. *Histor. Natural.* lib. VII. cap. 7.

to

to become an *aurelia*, or *chryſalis*; and quits it a ſecond time, to become a butterfly. There is reaſon to believe, that this led the miſtaken Dalenpatius into his error: but conſequences ſhould not be ſo eaſily forced in natural philoſophy. There are other animals, which do not change their ſkin, although they change their form. The frogs we have ſpoken of are an inſtance. It is the ſame as to the worms of the *ſemen:* which is a circumſtance of reſemblance to frogs. They do not change their ſkin when they become embryoes, by the way of conception: and this which we have is that which they had. It is the very ſkin, which makes the fine complexion of our prettieſt women.

The largeneſs of the head, comparatively to the reſt of the body, may be eſteemed a third circumſtance of reſemblance betwixt the fiſh-frogs and human embryoes: but which diminiſhes gradually in both, in proportion as the fiſh become frogs, and the embryoes men. We have ſeen above, that in an *embryo* of twenty-one days, the length of the head was the third of the whole. According to painters, who ſtudy theſe matters, it is not more than the fourth part in children; and the eighth in men.

## § IV. *Of the ſigns of pregnancy.*

The ſigns of pregnancy, that I reckon only from the ſecond month, are more certain than thoſe of conception; which concern only the firſt month: but they are not poſitive till the fourth.

1° In the ſecond month, the *menſes* have already failed twice: the breaſts begin to ſwell: there are heart-burns, ſickneſs, vomiting, diſguſts, and longings, of which we ſhall ſee the cauſe below. In a woman, who is in good health, and not ſubject to ſuch infirmities, the combination of theſe ſymptoms begin to make a conſiderable proof. This proof becomes

becomes ſtill more ſtrong in the third month: becauſe the *menſes* have then failed three times; the milk begins to come into the breaſts; and there are heart-burns, ſickneſs, vomitings, diſguſt, longings, and a ſenſible ſwelling of the hypogaſtric region.

2° But this proof is not complete, and certain, till the fourth month. Then the heart-burns, ſickneſs, vomiting, and longings, ceaſe; but the breaſt is full of milk; the bigneſs of the belly is viſible; and, what is a deciſive circumſtance, the child begins to ſtirr: and when the mother is not too fat, it may be diſtinguiſhed with a little attention, whether it be the head, elbows, or knees, which it moves.

3° The pregnancy is, therefore, demonſtrable only in the fourth month, and thoſe following. There is not the ſame certainty in the ſecond or third: as has been already ſaid: and it muſt be allowed, that even at that time, a dropſy, or *ſchirrhus*, may be confounded with pregnancy. The unmarried women, and widows, therefore, who have the misfortune to be with child, take care to hide their fault, by ſaying they have a dropſy or *ſchirrhus*.

4° Pregnancy may, nevertheleſs, even at that time, be diſtinguiſhed from theſe diſeaſes. In the aſcitic dropſy, or that of the *abdomen*, it is not the *hypogaſter* alone that is ſwelled; at leaſt unleſs in the caſe of an incyſted dropſy; which is very rare in that part: whereas, in pregnancy, the ſwelling does not riſe beyond the navel; at leaſt in the ſecond or third months. In the dropſy the ſwelling occupies the lateral parts of the *abdomen*; as well as the middle: whereas it occupies only the middle in the pregnancy. In the dropſy, the reſiſtance of the belly is weak; and gives way eaſily to preſſure: whereas the reſiſtance is ſtrong in pregnancy. In the dropſy there are none of the common diſorders, to which women are ſubject in pregnancy.

And,

And, to conclude, in the dropſy, unleſs indeed it be very inconſiderable in the degree, on ſtroking the belly, the fluctuation of the water is perceived; or to ſpeak more properly, the counterſtroke: which is not the caſe in pregnancy.

6° It muſt be allowed, that it is more difficult to diſtinguiſh pregnancy from a dropſy of the *uterus*. But, beſides that this kind of dropſy is rare, there is perceived in it, as well as in the *aſcites*, the fluctuation, or counterſtroke of the *ſerum* contained in the *uterus*, when the belly is ſtricken on one ſide, and the other hand laid on the oppoſite ſide; which is not felt in pregnancy. Moreover, in this kind of dropſy, the tenſion of the *uterus* is not ſo great as in pregnancy: as the patient has not the diſorders of a woman with child. This is ſufficient to inſpire a juſt ſuſpenſion of judgment, till the pregnancy becomes certain, in the fourth month, by the motion of the child.

7° With regard to ſchirrhuſſes, there are none, but thoſe of the *uterus*, which can be confounded with pregnancy: and they are very rare; and do not become, in three months, ſo big as the *uterus* of a woman with child does in that time. To which muſt be added, that the reſiſtance of a *ſchirrhus* is greater than that of pregnancy: and that the *ſchirrhus* never happens, but in women who have been a long time ill; whereas pregnancy happens moſt commonly to women, who are in very good health: and that, in the caſe of a *ſchirrhus*, the common diſorders of pregnancy do not appear.

8° There are, nevertheleſs, caſes, where women know ſo well how to diſſemble, and to tell lies with ſo much addreſs, that even an intelligent phyſician is left in ſuſpence; and dares not to pronounce poſitively, for fear of doing injury to a virtuous woman, or girl. Perhaps ſome more certain light might be gained, by examining them through the *vagina:* but I have generally ſeen them refuſe to ſubmit

ſubmit to it: which does not, however, diminiſh the ground of ſuſpicion. However that may be, it is proper to appear then, to give them their way; to promiſe to cure them of the diſorder they pretend to have; and, particularly, to give them hopes of bringing back their *menſes:* which they wiſh eagerly for: becauſe they know well, that circumſtance would ſet them free from their embarraſſment. But, at the ſame time, inſtead of diſſolvents, aperients, and emmenagogues, which would do injury to their child, to preſcribe them only ſtomachics, as rhubarb, bark, or coral, that cannot hurt them, till ſuch time, as the child, beginning to move, clears up all doubts of the matter.

9° On theſe occaſions, a phyſician, who is an honeſt and religious man, muſt watch with care to hinder any attempt on the life of the child; and endeavour, at the ſame time, to ſave the reputation of the mother, till ſuch time as a full evidence of the pregnancy authoriſes him to declare, to the perſon in queſtion, that if ſhe does not take care to make proper proviſion for her lying-in, he ſhall be obliged to inform her relations. A phyſician muſt, in ſuch caſes, be ſenſible of the duties of his profeſſion: and have the courage to perform them with prudence, though with dignity.

CHAP.

# CHAP. VII.

## *History of the progress, which has been made in the knowledge of the formation, and growth of the human* fœtus.

ALthough I have given, in the preceding chapter, what is known with most certainty, concerning the first rudiments of the formation of embryoes, I believe, it would not be useless to give an historical detail of the progress, that has been successively made in this subject: was it only to shew, by what slow degrees, the unfolding of the truth in physiological questions has been obtained. It will be a kind of digression, I confess; but it will be such, as may be easily omitted at pleasure. It is sufficient to say, it is not proposed here, to inquire what the *opinions* are, that physicians have had; which would be lost trouble at this time; but to relate what the *observations* are, which they have made on this subject; when they have made any such.

### § I. *What the antient physicians knew of the formation of the* fœtus.

There are two observations on this subject found in Hippocrates. In the first, which is in his treatise *De Natura Pueri*, he describes a germ, that came away from a woman, six days after conception, as he believes: *Ego vero*, says he, *qualis erat illa genitura referam. Ut si quis ovo crudo externam testam undique auferat, in quâ interiore membranâ contentus humor pelluceat, ad hunc fere modum se habebat liquor ille; prætereàque ruber erat & rotundus. Conspiciebantur autem fibræ albæ & tenues in membranâ cum sanie*

*ſanie craſſâ & rubrâ contentæ, & ipſa membrana exteriore parte cruore ad inſtar ſugillatarum ſuffuſa erat, in cujus medio tenue quiddam extabat . . . . ex eoque membrana tota genituram complectens.* This obſervation appears accurate, and is conformable enough as to eſſential matters, to thoſe which there is an opportunity of making on germs that come away in the beginning of pregnancy.

The other obſervation is in the treatiſe *De Carnibus*, towards the end: where Hippocrates, after having advanced that the *embryo* is perfect in ſeven days, *ubi genitura ad uteros pervenerit habet intra ſeptem dies, quæcumque ex corpore ei accedere neceſſe eſt*, adds, that he had had frequently an opportunity of obſerving many wounds, where the women diſcharge a kind of maſs of fleſh, and that the ſame may be obſerved, in proceeding like him; *Eam (carnem)* ſays he, *in aquam conjectam, ſi accuratius inſpexeris, membra omnia habere deprehendes & oculorum regiones & aures, & brachia. Quin & manuum digiti, & crura & pedes & pedum digiti, & pudendum, & reliquum totum corpus in liquido eſt.* In this obſervation, Hippocrates is much deceived in the age, that he gives to the *embryo*; which, if it was formed, as he ſays it was, ought to be at leaſt ſix or ſeven weeks old: as may be concluded from the following obſervations.

Although Hippocrates's information was, as we ſee, very imperfect, the phyſicians, who have come after him, have been very ready to adopt his notions. Galen, *De Formatione Fœtus*, cap. I. quotes the firſt of the two paſſages of Hippocrates, which we have mentioned; declares that it is taken from the book *De Natura Pueri*; and remarks, that he doubts, on this occaſion, whether that book was written by Hippocrates, or Polybius, his pupil: but he adds nothing new, any more than thoſe who have followed him, even down to our time.

Volcherus Coiter, a phyſician of Groningen, of whom there is a treatiſe *De Oſſibus Infantis*, men-

tions to have ſeen an abortive *fœtus*, of the length of a finger. But he goes no further, than ſaying, that the head was bigger in proportion than the reſt of the body; and that it reſembled the head of a monkey.

There is likewiſe in Fernelius, *Phyſiol. Book* VII. *De Hominis Procreatione*, an account, that he had examined an *embryo* of forty days old, of the length of half a finger's breadth; thick, as he ſays, as a large ant: in which he diſtinguiſhed all the parts well formed; the eyes; the noſe; the ears; the legs; and the fingers: which proves that this *embryo* was older than he believed it. But what is more aſtoniſhing, or to ſpeak more properly incredible, is, his adding, that this *embryo*, thick as a large ant, had its head as big as a filbert-nut: *caput*, ſays he, *par erat avellanæ*.

## § II. *What the modern phyſicians have diſcovered.*

The firſt tolerably accurate obſervations, that I know of, are the following, which Riolanus the father mentions, *Anatomicæ Fœtûs Humani Hiſtoria*. This is the firſt, *anno domini* 1608. *Vidi*, ſays he, *fœtum unius menſis . . . . in quo partes omnes externæ jam deſcriptæ & conformatæ erant, quæ tamen non apparebant, niſi merſo in aquam fœtu. Tunc licebat intueri oculos duobus punctis nigris deſignatos, pro auribus duo apparebant foramina, ipſis oculis inferiora. Os jam patebat, tota manus perfecta erat, in digitos ſecta; pedes tamen erant imperfecti, breviores manu, nec in digitos fiſſi. Inter femora rimulam obſervabam, quæ locum vulvæ referebat.*

The other obſervation appears to have been made on a younger *embryo*. *Anno ſequenti*, ſays Riolanus, *alterum fœtum inſpexi bombicis magnitudine, eique figurâ planè ſimilem, exceptis artubus, qui velut filamenta candida è trunco corporis explantata apparebant. Manus quidem*

*quidem in digitos divisa erat, pedes autem integri. . . . Caput reliquo corpore grandius apparebat, pro oculis bina foramina, quibus interjectum erat spatium naso destinatum; aurium foramina oculis paulò inferiora, quæ quidem omnia non nisi fœtu in aquam mersо conspiciebantur.*

There is, in Theodorus Kerckringius, in his *Anthropogeniæ Ichnographia*, printed at Amsterdam, 1670, *Cap.* I. *Lib.* II. and III. three important observations, that regard the early time of pregnancy; which induces me to mention them, and copy the figures added by the author.

As Kerckringius believed with Harvey and Wharton, that men come from *ova*, which were in the *ovaria* of women, he describes two of these *ova*, *in the first chapter*, which he had taken from the *ovaria* of women. "They are, says he, round "bladders, as big as little pease, although they are "not all of the same size; full of an aqueous hu-"mour; sometimes yellow, and sometimes colour-"less; which, by the heat of a fire, grow as hard "as the white of an egg."

This is the first figure, which, as well as the description made of it, agrees with those, that are to be found in the more modern anatomists.

In the following chapter, the author speaks of a yet more important observation. A woman, having had commerce with her husband, at the end of her *menses*, died suddenly four days after. Kerckringius having been called to open her, and discover the cause of her death, found, in the *uterus*, an *ovum*, as big as a cherry; which he took away to examine at his leisure. He found, in this *ovum*, a little cylindrical body, of a gelatinous substance; in which, there was not any appearance of conformation; but of which the head appeared to be distinguished from the rest of the body by a little diminution, and in which he believed he distinguished, but very weakly, some points which seemed to mark

the parts. *Caput*, ſays he, *clarè à corporis mole diſtinctum. In capite quaſi per nebulam annotata organorum puncta. Corporis autem reliqui rudis indigeſtaque moles, uti eam vides hic eâdem, quâ eſt, magnitudine depictam.*

The ſecond figure anſwers to this deſcription.

A. *Repreſents the interior ſurface of the* chorion, *and* amnion: *in which, there is not found the leaſt traces of any* placenta.

B *The* embryo, *in which is remarked the diſtinction of the head from the body: but without any other appearance of conformation.*

The third obſervation, which Kerckringius relates, in *Chap.* III. is of an *embryo* of fifteen days age: in which was already diſtinguiſhed, in the head, the rudiments of eyes, noſe, mouth, and ears: a matter I can ſcarcely credit. But he adds, that the body had arms and legs. *Corpus in brachia pedeſque diviſum erat:* which is contradicted, as we ſhall ſee below, by more authentic obſervations.

It appears even that figure the third, where Kerckringius has delineated this *embryo*, falſifies the deſcription, which he has given of it. For, in this figure,

A. *Repreſents the* placenta, *in which there are ſome little arteries and veins.*

BBBB. *The* chorion, *ſeparated into four pieces.*

CCCC. *The* amnion, *ſeparated in the ſame manner.*

D. *The* umbilical cord.

E *The* embryo: *in which is ſeen ſome appearance of members; but not any legs or arms, of which the author ſpeaks in his deſcription.*

In proportion to the advance towards our own times, the obſervations are more accurate; and more to be depended on. There are in the Memoirs

moirs of the Academy of Sciences of the year 1701, two, which we believe neceſſary to be inſerted in the chapter of pregnancy. The firſt is one of Mr. Dodart's, a phyſician of the faculty of Paris, an attentive and accurate obſerver, who underſtood well what he ſaw. The ſecond is one of Mr. Littre's, a celebrated anatomiſt; it is in the ſame volume of the Academy: and we have related it alſo in the ſame chapter. It is more extraordinary than that of Mr. Dodart: with which moreover it agrees. The two obſervations are the moſt to be relied on, and the moſt inſtructive, of any we have on this ſubject.

I ſhall join, to theſe obſervations, thoſe which are found in Frederic Ruyſch, a phyſician and anatomiſt of Amſterdam; and in John Baptiſt Bianchi, profeſſor of phyſic, in the univerſity of Turin, which are intirely conformable.

Ruyſch has many times explained himſelf, in his works, in a manner very clear, and preciſe. We have mentioned above one of his paſſages, in the note to page 106. As his opinion is poſitive, and agrees with the obſervations of Meſſ. Dodart and Littre, I conceive it would be uſeleſs to examine other paſſages: and that it ſuffices, to copy ſix of his figures: of which three are taken from the ſecond plate; and three from the third of the ſame *Theſaurus Anatomicus.*

The firſt of theſe figures (*a*) repreſents an human *embryo*, as large as a grain of huſked barley, adhering to the *placenta*, by the umbilical cord.

A. *The head of the* embryo.
B. *The body of the* embryo, *without any appearance of arms or legs.*
C. *The* umbilical cord.
D. *The* placenta.

(*a*) Fig. I. Tab. II.

The second figure (*b*) represents an human *embryo*, a little older than the preceding: of which, the head is better separated from the body; and, of which, some rudiments of limbs appear like little tubercles.

A. *The interior surface of the* placenta.
B. *The exterior surface of the* placenta.
C. *The head of the* embryo.
D. *The body of the* embryo.

The third figure (*c*) represents an *embryo*, half a finger's breadth long: of which the head is even distinct from the body; and in which the appearances, or beginning of limbs, are better marked; with an umbilical cord, very large.

The fourth figure (*d*) represents an *embryo*, still a little longer: in which, the members appear more distinctly; and the umbilical cord is very large, perhaps through the effect of some disease.

The fifth figure (*e*) represents an *embryo* yet bigger: of which the cord is less; and there begins to be perceived some appearance of fingers and toes, at the end of the limbs; which are very long.

The sixth figure (*f*) represents an *embryo*, of which the members are more unfolded.

Bianchi has not explained himself less clearly than Ruysch, on the gradual unfolding of the limbs of the *embryo*, in the work, which he published under the title of *Historia de Naturali in Humano Corpore, vitiosâ, morbosâque Generatione*, printed at Turin, in 1741, in octavo. And I could quote very express passages from it: but the figures that I shall borrow, are sufficient to prove what I have said concerning it. I have copied ten of them; all taken from the first plate of that work.

(*b*) Fig. II. Tab. II. (*c*) Fig. III. Tab. II. (*d*) Fig. IV. Tab. II. (*e*) Fig. V. Tab. II. (*f*) Fig. VI. Tab. II.

The

The firſt figure *(g)* repreſents a fecundated *ovum*, after four days, as Bianchi pretends. For he ſays, that the woman, from whom it came, had her *menſes* four days before. The *ovum* was longiſh: and its ſurface a little reddiſh and unequal; but, what is moſt important, Bianchi aſſures us, that there might be diſtinguiſhed, in the middle of it, at the firſt view, a little worm; which is the principle of fecundation.

The ſecond figure (*h*) repreſents an *ovum* fecundated ſeven days, according to the teſtimony of Bianchi, more oval than the preceding: in the middle of which, was diſtinguiſhed a bigger worm, ſmooth, ſlender, and with a long pointed tail, without any appearance of limbs; but remarkable for the largeneſs of the head; and hanging by a thread; which was the umbilical cord.

The third figure (*i*) repreſents the worm of the preceding figure, magnified by a microſcope. Bianchi aſſures us, that this *ovum* came away from a woman, ſeven days after her marriage.

The fourth figure (*k*) repreſents a worm, or to ſpeak more properly, a very little *embryo* of ſeven days, as Bianchi aſſerts: in which, the head is better diſtinguiſhed from the body; there begins to appear two little buttons, where the eyes are intended to be; and the tail is much ſhorter.

The fifth figure (*l*) repreſents an *embryo* of ſixteen days; in which the form of a worm is obliterated; the head well marked; the limbs grown longer; the body bigger; and no remains of tail appears.

The ſixth figure (*m*) repreſents an *embryo* of twenty days: in which, all the parts are ſtill better unfolded, although there be not any yet, which are intirely perfect. As in the deſcription of Mr. Do-

*(g)* Fig. IV. Tab. I. (*h*) Fig. V. Tab. I. (*i*) Fig. VI. Tab. I. (*k*) Fig. VII. Tab. I. (*l*) Fig. VIII. Tab. I. (*m*) Fig. IX. Tab. I.

dart, the *fœtus* of twenty-one days was leſs perfectly formed than that which Bianchi deſcribes; and which he makes only twenty days old; this author maintains, that Mr. Dodart has ſuppoſed his *fœtus* older than it really was: and that it could not be more than ſeven days old, as the *fœtus* of the fourth figure.

The ſeventh figure (*n*) repreſents an *embryo* of twenty-five days, affixed to the *placenta*, by the cord: and in which is ſeen the progreſs of the limbs; at the end of which, the marks of fingers and toes are begun to be diſtinguiſhable.

The eighth figure (*o*) repreſents an *embryo* of thirty-ſix days: and the ninth figure (*p*) another of forty: in which is ſeen the progreſs of the unfolding of the parts; that are, nevertheleſs, even yet not perfect.

The tenth figure (*q*) repreſents a *fœtus* of two months and a half: in which all the external parts have attained their natural conformation; and require only to grow bigger and ſtronger.

## § III. *Of the information, which may be gained from the examination of the* ova, *when they are opened.*

I conclude with three important reflections. The firſt is, that the figures, which I have borrowed from Kerckringius, Ruyſch, and Bianchi, do not agree with each other: and Bianchi, who acknowledged it, accuſes the figures of the two others, of not being accurate. He may be right: but I would not take upon me to anſwer, that the figures, which he has engraven, are more juſt. Nothing is more difficult than to repreſent truly the parts of the human body; which has always made me ſuſpect

(*n*) Fig. X. Tab. I. (*o*) Fig. XII. Tab. I. (*p*) Fig. XIII. Tab. I. (*q*) Fig. XIV. Tab. I.

the

the moſt boaſted figures of anatomy: and the more, as the ſame parts of the human body do not always ſhow themſelves in the ſame form. But theſe figures, ſuch as they are, have appeared proper to me, in order to give an idea of the aſtoniſhing changes, which happen to the ſeminal worms, and the embryoes, in the early time of pregnancy.

The ſecond is, that there is nothing certain in the age, theſe authors give to the germs, or embryoes, which they have obſerved, and given the figures of. Ruyſch has candidly admitted it, in more than one place; particularly in *Theſ.* IV. N° 40. n. 4; and *Theſ.* VI. N° 45. and *tab.* 6. There are, nevertheleſs, in ſome of the obſervations, which they have related, particular circumſtances that fix the age of the embryoes. But after all, the error, as to this matter, does not make any difference in the conſequences we would draw from the obſervations.

The third is, that chance furniſhed the opportunity of ſeeing, and examining the germs, and embryoes, of which they have given the deſcriptions, and figures. Obſervators, equally curious, may, perhaps, paſs their whole lives without having the ſame good fortune. But there is an eaſy way to ſupply the defect: which is, the examining every day, and even ſeveral times a day, the progreſs of the formation of a chicken, from the firſt moment of incubation, to the twenty-firſt day: being the time, in which chickens are uſually hatched. Nothing more is requiſite for this, than to procure a turkey hen, who can ſit on twenty, or two-and-twenty eggs: or two hens, which can each ſit on fifteen each.

It is a piece of advice, which Hippocrates has given a long time ago *. *Si quis enim ova viginti, aut etiam plura, gallinis duabus aut pluribus, ut excludantur, ſupponat, & ſingulis diebus à ſecundo exorſus ad*

* *De Naturâ Pueri.*

*ultimum*

*ultimum uſque, quo ovi putamen detrahitur, ſubtrahat, frangat, diligentur inſpiciat, is eo quo dixi modo, omnia ſe habere deprehendet.*

Phyſicians were a long time without profiting of this advice: but, at length, having become more curious; they have made uſe of it for about a hundred years. This has procured ſome excellent works; in which, by properly applying to the human *fœtus*, the changes that chickens have been found to undergo in the egg, very important lights have been thrown on the myſtery of generation. Such is the treatiſe *De Formatione Ovi & Pulli*, of Jerom Fabricius de Aquapendente; printed at Venice, in 1621, *in folio*. The work of doctor William Harvey, *De Generatione Animalium*, printed at London, in 1657, *in quarto*; which turns principally on the formation and growth of chickens, obſerved during incubation. The obſervations of Theodore Aldes, an Engliſhman, or to ſpeak more properly of Matthew Slade, of Amſterdam, on the ſame ſubject. And the two excellent diſſertations of Marcellus Malpighi; the one *De Formatione Pulli in Ovo*, printed at London, in 1666, *in quarto*; the other intitled *Appendix repetitas auctaſque de ovo incubato obſervationes continens*: which, as well as the preceding, are in the firſt tome of the *Bibliotheque Anatomique* of Le Clerc, and Manget.

But however exact theſe obſervations may be; and whatever notion ſhould be entertained of the ability of thoſe who made them, I would wiſh perſons, who are truly curious, to repeat them, in order to ſee, with their own eyes, what theſe authors have ſeen: and to ſee if they have ſeen rightly, and ſeen every thing. This courſe of experiments is neither difficult, nor expenſive: and, at all adventures, the trouble will be well repaid by the frequent occaſions of admiring the goodneſs, wiſdom, and power of God, diſplayed in the changes, and wonderful unfoldings, which happen in the formation of chickens:

chickens: and what is more important ſtill, in the correſpondent changes and unfoldings, which happen in the formation of the human body: diſtinguiſhing, according to the reaſon of the caſe, what is proper to the *fœtus* of chickens, from what is proper to the *fœtus* of men.

## CHAP. IX.

### *Examination of ſome opinions on the nouriſhment of the* fœtus.

IN the ſeventh Chapter, we confined ourſelves to the mentioning what we believed to be moſt certain, reſpecting the manner of the *fœtus*'s being nouriſhed in its mother's womb, without breaking the thread of our explanation to prove what we advanced; or to anſwer what has been ſaid againſt it. Becauſe we were perſuaded, that the laying open the truth was ſufficient, in order to diſſipate the fantoms of error. It muſt, nevertheleſs, be granted, that ſeveral of the facts, we have advanced, are held as doubtful; and that, among the objections, which are oppoſed to it, there are ſome that are ſpecious. For theſe reaſons we have thought it neceſſary, to employ this chapter in eſtabliſhing the veracity of theſe facts; and in anſwering the objections propoſed.

PROPOSITION I. The umbilical cord; or, at leaſt, the vein, which is included in it, ſerves to carry, to the *fœtus*, the nouriſhment, which the *placenta* receives from the mother.

This truth cannot be denied, if ever ſo little attention be given to the conformation of the cord; the diſtribution of the arteries, and veins in the *placenta*;

*centa*; and the continual circulation, which is made, from the *fœtus* to the *placenta*, by the vein.

To what purpoſe, would be all this *apparatus*, if it had not the uſe, which we give it; or, to ſpeak more properly, which all the world give it. All that we have ſaid, with regard to the *fœtus*, may, moreover, be confirmed by the inſtance of all the oviparous animals; of which the young are nouriſhed through the navel, ſo long as they continue in the *ovum*.

I am aware, that the inſtance of ſome fœtuſſes well nouriſhed, and come to the time, although the umbilical cord was not affixed to their navel, and that they could not receive their nouriſhment by it, will be objected to me. But I know, however, in all, only of three obſervations of that kind; which are thoſe I have quoted below at the bottom of the page *. It would be eaſy to ſhow, that no advantage can be taken of this: becauſe, in theſe three caſes, the cord had been torn, either in the delivery, or a little time before: which often happens when the *fœtus* is very paſſive, or the cord too ſhort: as is juſtified by the paſſages † quoted at the bottom of the page. But it appears uſeleſs to inſiſt longer, on proving the neceſſity of the cord for the nouriſhment of the *fœtus*: which it is palpable, nobody can diſpute.

PROPOSITION II. So long as the fecundated *ovum* remains affixed to the *ovarium*, it is nouriſhed, like the other parts of the body: but that does not continue a long time. As ſoon as it is ſeparated, it takes its nouriſhment only from the juices of the *placenta* abſorbed by it, as by a ſpunge: in the Fallopian tube, from the mucilaginous lymph,

* Journal des Sçavans, *ann.* 1673.
Stalpart van der Viel. *Obſerv. Rariorum Cent.* II. *Obſer.* 32.
Acta Naturæ Curioſorum. *Decur.* II. *Ann.* VII. *Obſerv.* 209. *p.* 392.

† Acta Naturæ Curioſorum. *Vol.* I. *Obſerv.* 217. *p.* 451.
Acta Eruditorum Lipſienſia. *ann.* 1707. *Septemb. p.* 402.

which

which is ſecreted by its coats; and which ſuffices for the nouriſhment and growth of the *fœtus* in the pregnancies of the tubes: in the *uterus*, till ſuch time as it adheres, that is to ſay, all the firſt month, from the milky lymph, in which it ſwims; and from a more milky lymph, when the *placenta* has begun to unite itſelf in the ſecond month.

This propoſition is certain: becauſe it is the only nouriſhment the *fœtus* can have, till the third month. Let us admire, therefore, in this, with what care Providence watches for the preſervation of the *embryo*. The *placenta* receives, in the beginning of pregnancy, no nouriſhment, but what it can abſorb, without its being impelled into it. It conſequently receives but little then; and even that very ſlowly. This is what is proper for an *embryo:* as it is a ſmall nouriſhment for a ſmall body: and a nouriſhment very gently propelled, that it may not tear or ſuffocate an *embryo* of ſo ſoft a texture.

PROPOSITION III. In the third month of pregnancy, the *placenta*, by its growth, preſſes more ſtrongly againſt the *uterus*; obſtructs there the courſe of circulation; and occaſions the dilatation of the veins, and conſequently of the cœcal *appendices*, or lateral veins; which, by dilating, elongate, protrude themſelves into the cellular ſubſtance of the *placenta*, and depoſit there the blood, that is to be carried to the *fœtus*. At that time the *fœtus*, become larger, begins to nouriſh itſelf not only with the uterine milk, which flows from the vermicular veſſels, but even with the blood, which the cœcal veins furniſh.

The truth of this propoſition is demonſtrable, from the inſpection of the branches of veins of the *uterus* protruded into the *placenta*. It has been already ſaid; and the fact is certain; that if there be an opportunity of opening the *uterus* of a woman, dead in the ninth month of pregnancy; and the

the *placenta* be ſeparated gradually; there will be ſeen to unſheath themſelves, in different places of its ſubſtance, veinous veſſels; of which, ſome are two lines in diameter, and nearly two or three lines in length; being collateral branches of the uterine veins. It is evident then, that theſe veins pour the blood of the mother into the *cellulæ* of the *placenta*, where they open; that it is carried into the *fœtus* by the umbilical vein; and that it ſerves for its nouriſhment.

There is not even occaſion to open an *uterus* in the ninth month of pregnancy, of which an opportunity does not often happen, in order to be convinced of the truth we have advanced. It is ſufficient, to remark the *lochia*, that follow delivery. The blood, that flows then abundantly, comes from thoſe veins; which diſcharges it into the *uterus*; becauſe the *placenta* is ſeparated from it. That it is poured into the ſubſtance of the *placenta*, as long as it is affixt to the *uterus*, is evident; as is alſo that this blood, paſſing from thence into the *fœtus*, ſerves to nouriſh it.

After proofs ſo clear, the obſervation of Mr. Mery might eaſily be paſſed over. But as that Academician believed it convictive for the eſtabliſhment of his opinion, which is the ſame as ours, we are not willing to omit it*. "A pregnant woman," ſays he, "who was near her time, was killed al-"moſt inſtantly, by a violent fall. There were "found ſeven or eight pints of blood, in the ca-"vity of her belly: and all the blood-veſſels in-"tirely emptied. Her child was dead, but with-"out any appearance of wound: and all its veſſels "were exhauſted of blood, as well as thoſe of its "mother. The body of the *placenta* ſtill adhered "to all the interior ſurface of the *uterus*; where "there was not any extravaſated blood. The blood

* Memoires de l'Academie des Sciences, *année* 1708. *p.* 87.

"of

" of the child, therefore, could not be evacuated, " but by the veins of the *uterus:* which proves " the communication of the blood veſſels of the " child, and the mother."

Mr. Mery believed this reciprocal communication. According to him, the capillary veins of the arteries of the *uterus*, which are naturally inoſculated with the capillary branches of the veins, ſeparate from them; and inoſculate with the umbilical capillary veins; where they diſcharge the blood, which they contain. This blood, conveyed into the body of the *fœtus*, by the trunk of the umbilical vein, is returned back into the *placenta*, by the umbilical arteries: of which the capillary branches inoſculate with thoſe of the uterine veins; from which they bring back the blood. By this means a continual circulation is made from the mother to the *fœtus*; and it can, therefore, be regarded only as a part of the body of the mother.

But how could Mr. Mery conceive, and adopt ſuch a ſyſtem, directly contrary to the diſtribution of the blood-veſſels in the *uterus* and *placenta:* and which, moreover, labours under many impoſſibilities? How do the capillary ramifications of the uterine arteries, inoſculating, according to the order of circulation, with capillary branches of the uterine veins, ſeparate themſelves from them? How, after being ſeparated from them, do they come out into the cavity of the *uterus*, to inoſculate with the capillary branches of the umbilical vein? How do the capillary branches of the umbilical arteries come to meet the capillary branches of the uterine veins, to inoſculate with them; and furniſh the blood which the arteries of the *uterus* had brought to the umbilical vein? What becomes of the capillary branches of the uterine arteries, and veins, when the *placenta* is ſeparated from the *uterus?* Do they inoſculate anew? That appears impoſſible. Or, Do they remain ſeparated, and diſunited? The order

order of circulation of the blood in the *uterus* would not then ſubſiſt any longer.

The ſecretary of the Royal Academy of Sciences, without being a phyſician, was very ſenſible of the defect of this ſyſtem. "It is wonderful, ſays he*, "that, to an intire body, ſo compact in itſelf, and "ſo well connected together, as that of an animal, "a new part can be added; that is to ſay, the "*placenta*, and *fœtus*, which unite themſelves with "it as ſtrongly as all the others: and which, after "having been ſo ſtrongly united, can ſeparate "themſelves from it again, without any deſtruc-"tion."

The ſyſtem, which we follow, is not ſubject to any of theſe inconveniences. It is agreeable to the known diſtribution of the veſſels of the *uterus*. In this ſyſtem, the mother gives the blood to the *fœtus*, in the third month, by the cœcal veins. But the *fœtus* never gives it back to the mother in the natural ſtate. The blood might, nevertheleſs, in the caſe of Mr. Mery's obſervation, have a retrograde motion from the *fœtus* to the mother, in proportion as the veſſels of the mother were exhauſted, by the ſame veins: becauſe they are not provided with any valves, which could prevent it. Finally, when the *placenta* ſeparates itſelf from the *uterus*, theſe veins, after having ſupplied, for ſome time, the blood of the *lochia*, grow ſhorter, contract, and cloſe up; and the whole is reſtored to the natural ſtate, in the ſame manner, as at the end of the *menſes*.

I cannot diſpenſe with again ſuggeſting the admiration due to the providence of God, with regard to the nouriſhment of the *fœtus*. As it becomes larger and ſtronger, it has occaſion for a ſtronger and more copious nouriſhment, in the third month: and this nouriſhment is the blood, which the mo-

* Hiſtoire de l'Academie des Sciences, *ann.* 1708. *p.* 38.

ther

ther furniſhes to it at that time. It is not, however, arteries, but veins, which ſupply it. Though the proper veins do not furniſh it, by the direct courſe: but cœcal veins, by a lateral courſe. All theſe precautions were neceſſary, that the *fœtus* ſhould not be ſuffocated, by the abundance of bood, it might receive; or by the impetuoſity, with which it might receive it. It was ſtill further neceſſary, that the velocity of the veinal blood, however weak it may be, ſhould be rebated in the cellular ſubſtance of the *placenta*; in order to procure that degree, which was moſt adequate to the ſtate of the *fœtus*.

After ſo many, and ſuch ſtrong proofs, one might believe, that the truth of the *fœtus*'s being nouriſhed by the blood of the mother, would not be diſputed. But this is not the caſe. It has been ſtrongly oppoſed, particularly on the induction, which Mr. Mery pretends to found on his obſervation above-mentioned. There was maintained, in 1711, in the faculty of medicine *, a *theſis*, in which, to deſtroy it, the following experiment, which had been made and repeated ſeveral times with great care, was reported. A bitch, ready to whelp, was taken. She had been bled, till ſhe was as much exhauſted of blood as was poſſible, in ſuch manner, that there did not remain above half an ounce, which was yet in the heart, or about it. She was afterwards opened; and her whelps were not only found full of blood; but living: and this, although the mother was not opened till half an hour after her death.

This fact is diametrically oppoſite to that of Mr. Mery: and, conſequently, the induction from it deſtroys that of Mr. Mery. This objection appear-

* It was propoſed in theſe terms, *An Fœtui ſanguis materinus alimento?* and it was concluded in the negative. I do not know whether this *theſis* muſt be attributed to the preſident, Mr. Camillus Falconer; or to the ſupporter of it, Mr. Anthony Juſſieu.

ed very ſtrong to the Academy: and Mr. Mery was a little diſconcerted with it. Nevertheleſs, this experiment proves nothing: or it proves too much; which is, that bitches furniſh no blood for the nouriſhment of their young: and that there is no communication betwixt the blood-veſſels of the *uterus*; and thoſe of the *placenta*; which I believe not only with regard to bitches; but alſo other animals. There are not found, in the uteruſſes of theſe animals, any cœcal veins; at whatever time they are examined. When a ſeparation is made, in a bitch, who has nearly gone her time, of the *placenta*, full of young, from the *uterus*, there does not flow a drop of blood from the *uterus*. The ſame holds good of the *cotyledones* of cows. Theſe animals have no bloody *menſes*; nor *lochia* after having calved. It is evident, therefore, that theſe animals do not furniſh any blood to their young: and this is all, that can be concluded from the experiment reported in the *theſis* of medicine. But this does not hinder, that we ſhould believe the contrary, with reſpect to women, who are, in all reſpects, under different circumſtances.

It may, perhaps, be imagined, that advantage may be taken from what I have mentioned of thoſe animals, in order to apply it alſo to the caſe of women. Cows, it may be ſaid, nouriſh their calves; and mares, their foals, with milk only, without one drop of blood. Women may, therefore, nouriſh in the ſame manner their fœtuſſes, which are leſs, with milk only. What need is there, in them, to ſeek for any other nouriſhment for their children: ſince it is not requiſite, in the caſe of the animals, of which the fœtuſſes are larger, and ſtronger.

But can ſuch reaſonings overturn facts that are certain, and demonſtrable? It is a demonſtrated fact, that women ſupply blood to their fœtuſſes. Is it right to deny this fact: becauſe the females of other animals do not ſupply it? But whence is it pretended,

pretended, it may be aſked, that this difference ariſes? It ariſes, perhaps, from this, that it is proper to furniſh the human *fœtus* with a ſtronger nouriſhment, to give to their parts, and particularly to their brain, the elaſticity and firmneſs neceſſary for the ſuperior functions, for which they are deſigned. But, after all, who are we, that we ſhould fathom the counſels of God? Let us content ourſelves, to know, and admire what he has made, without enterprizing to penetrate into the motives, which have induced him to form things as they are.

What may make more impreſſion than all theſe vain reaſonings, is, that Ruyſch, the celebrated anatomiſt *, has denied there is any communication betwixt the veſſels of the *uterus*, and the *placenta*; conſequently, that there does not paſs one drop of blood from the mother to the *fœtus*.

But it is ſurpriſing, that Ruyſch, who had the office of examining midwives in Holland; who was often called to difficult labours, where he had occaſion to operate; and who had, conſequently, many opportunities of ſuſpecting the uteruſſes of women, who died in child-bed; did not know the diſtribution of the uterine veins; and was ignorant of the cœcal veins, or veinous *appendices*; although it appeared, by the deſcriptions he made, and the figures he gave, that he had ſeen them more than once, without knowing them; as will be proved in another place †.

To ſay the truth, Ruyſch had a great dexterity in injecting, and preparing the parts: but I wiſh the manner in which he ſometimes made preparations, did not deceive him. For his judgment muſt be ſuſpected. He was obſtinate againſt all evidence, in maintaining, that the exterior ſurface of the *pla-*

* Theſaurus II. *Aſſere* IV. N. XVIII. n. 1.

† In a diſſertation at the end of this work, where it will be attempted to remove the doubts of Mr. Van-Swieten.

*centa*, which is in contact with the *uterus*, was covered with a membrane, that is an expansion of the *chorion*. It must, in consequence, be denied, that the vessels of the *uterus* could pass through it, to carry the blood into the *placenta*, and from thence into the *embryo* *; and he has denied it, as, also, that the *placenta* could suffer milk to pass. This throws him into a great *dilemma*, when he would explain the nourishment of the *fœtus:* and he is forced to confess, that he does not comprehend it. Can any value, therefore, under these circumstances, be set on his authority: or can he be judged a proper person, to decide this question?

PROPOSITION IV. The *fœtus* is not nourished, in its mother's womb, by the mouth.

To maintain the contrary; it is necessary to say, the *fœtus* sucks: and in order to that, to say, it breathes. But it is certain the *fœtus* does not breathe, while it is in the *uterus*, surrounded with the afterbirth. It is impossible, therefore, that it should be nourished by the mouth. It may, perhaps, be said, that it may swallow without sucking; and it is indeed possible, provided it be allowed, that this manner of swallowing furnishes only a little nourishment. But what occasion is there, to dispute on a fact, destroyed by observations? There have been found a great number of fœtusses, as well human, as those of other animals, which had neither head, mouth, or any thing that could supply the place of a mouth: and which went to the time, large, and well nourished. I could cite † a great number of instances of it: but I shall content myself with the three following, related by Mr. Littre ‡. The two first were males; the one of the age of seven

* Ubi Suprà, & *Thesaur.* V. *Assere* II. N. XLI.

† Among others, *Acta Naturæ Curiosorum. Decur.* I. *ann.* 3. *p.* 990. *Ibidem.* Decur. II. *ann.* 9. *p.* 358.

‡ Memoires de l'Academie des Sciences, *ann.* 1701, *p.* 91.

months;

months; and the other of eight; both of them large and fat. That of seven months had neither head, nor neck: and the upper part of the trunk was covered with skin, as well as the rest of the body. The head only was wanting, in the *fœtus* of eight months; and the upper part of its neck was covered with skin. The third *fœtus*, which was female, was at the time, and very well nourished: but had the holes of the nostrils and mouth intirely closed; and the places, where they should be, did not differ in colour, or consistence, from the other parts: which proved, that this deficience was a fault in the original conformation.

After such a proof, I do not know, whether, or no, I ought to take notice of a frivolous objection. The new-born child sucks the breast of its nurse, say they, as soon as the end of the nipple is put into its mouth; from whence, there is thought to be reason to conclude, that it has already learnt to suck in the *uterus*. I desire, in my turn, them, who may make this objection, to tell me, whether the first time the *fœtus* sucks in the womb of its mother, supposing it sucks there at all, it has learnt to suck before? Palpably not: since it is supposed to suck then for the first time. But where is the good of starting such difficulties? Are we ignorant, that the Creator has formed the bodies of men, and brutes, with so much art, that such and such impressions on the senses excite there mechanically such and such motions? It is thus, that ducklings, at the first sight of water, throw themselves into it. It is thus, that chickens, at their coming out of the egg, begin to run, and scratch the ground, to find somewhat to eat. In short it is thus, that a new-born child, which has never had the breast, compresses the end of the nipple of the nurse, as soon as she puts it in its mouth; and sucks.

PROPOSITION V. The *fœtus* is not nourished by the fluid contained in the *amnion*.

This propoſition is only a corollary of the preceding one. To be nouriſhed by this fluid, it is neceſſary, that the *fœtus* ſhould take it in by its mouth. But there have been many fœtuſſes, which have had no mouth, nor any thing to ſupply the place of one; and which, nevertheleſs, were large, fat, and well nouriſhed. It is not, therefore, either by the fluid of the *amnion*, or the mouth, the *fœtus* is nouriſhed.

Moreover, the fluid of the *amnion*, which would perhaps be fit for the nouriſhment of the *fœtus* in the firſt months of pregnancy; becauſe it is then a ſweet and mucilaginous lymph, like the white of an egg; would not be any longer proper for that purpoſe, from the third month of pregnancy; and yet leſs towards the end: becauſe it is then altered by the mixture with it of the urine of the child; becauſe it is nothing then but a ſaline muriatic *ſerum*; notwithſtanding that would be the time when it would be moſt neceſſary, ſuppoſing it ſerves to the nouriſhment of the *fœtus:* and becauſe the *fœtus*, being become larger, would have occaſion for a more copious nouriſhment.

In vain it is oppoſed, in order to weaken this opinion, that there is found, in the throat, and ſtomach of ſtill-born children, a lymphatic fluid, analogous to that of the *amnion:* and that there is, even in their inteſtines, a thick black viſcid matter, like pitch, known under the name of *meconium*, which new-born infants void of themſelves; or which care is taken to make them void; that can be only the relicts of digeſtions performed in their ſtomach during pregnancy.

How can it be overlooked, that, in fœtuſſes, the ſecretions muſt be made in ſmall, in all the places where they are to be larger afterwards; without which, the ſecretory ducts, they ſhould be made through, would be deſtroyed: that thus is made in them, during the nine months of pregnancy, ſecretions

tions in the ſalival glands; and in thoſe of the *æſophagus*, and ſtomach: that this is the ſource of the lymphous humidity; which moiſtens the mouth, and *æſophagus*, and of the ſmall quantity, which is collected in the ſtomach: that thus is ſeparated in the ſame manner, the pancreatic juice; the inteſtinal humour; and particularly, the bile, in the colour which are proper to them; and that theſe humours collected, and thickened in the inteſtines, form this kind of pitchy matter, as may be judged, by the bilious bitterneſs, which thoſe have perceived, who have had the curioſity to taſte it.

Every thing being thus diſcuſſed, let us conclude, that the opinion we have adopted in the foregoing chapter, on the nature of the humours, which ſerve for the nouriſhment of the *fœtus*, and of the manner in which they are applied to that purpoſe, is the moſt juſt; and agrees the beſt with all the known facts, that concern this matter: and therefore ſhould be admitted.

1° That during the time, in which the fecundated egg is deſcending from the *ovarium* into the *uterus*, along the Fallopian tube, it is nouriſhed, as well as the *embryo* it incloſes, by the mucilaginous lymph, which is ſeparated in the glands of the tubes.

2° That when the *ovum* is arrived in the *uterus*, it is nouriſhed, during the whole time it floats in the fluid, which is collected there, by that fluid: which is a milky lymph, formed by the vermicular, or lactiferous veſſels of the *uterus*.

3° That, as ſoon as the *placenta*, in growing, affixes itſelf to the *uterus*, the *fœtus* is nouriſhed by a more milky lymph; which becomes ſtill more ſo from day to day, that paſſes from the vermicular veſſels immediately into the *placenta*; and from thence into the *fœtus*.

4° Laſtly, That, towards the end of the third month, the veinous *appendices*, or cœcal veins, pro-

trude themſelves into the cellular ſubſtance of the *placenta*; and diſcharge there the blood, which is conveyed to the *fœtus*, that is nouriſhed by this means, from that time to the end of pregnancy; both by the uterine milk which it received before; and by the blood of the mother, which it begins now to receive.

## CHAP. X.

### *Of the conduct, which women ſhould follow during pregnancy: the diſorders attending pregnancy: and the precautions, which ſhould be taken in the treatment of diſeaſes, that may be incident to pregnant women.*

AS theſe three ſubjects have great relation to each other, we were of opinion they might be comprized in one chapter: but we ſhall nevertheleſs diſcuſs them ſeparately.

### § I. *Of the conduct, which women ſhould follow during pregnancy.*

The conduct, which women ſhould purſue, when they are with child, regards the *regimen* they ſhould obſerve, or the remedies which it is proper for them to take.

I. With relation to the *regimen*, they muſt obſerve a moderation in the quantity of their food. It will be ſhewn below, that too great a quantity of blood, which abounds in the women, in conſequence of the detention of the *menſes*, is the principal

pal cauſe of the diſorders they undergo; and of the danger, to which their offspring is expoſed. It is proper, therefore, to diminiſh the quantity of their food: regard being had, nevertheleſs, to the manner, in which they have been accuſtomed to manage themſelves as to this point. I ſuſpect, that the ſickneſs and vomitings, which are incident to women in the early part of pregnancy, have been wiſely inſtituted, by the Author of nature, to diminiſh effectually the too great abundance of chyle, which they would otherwiſe make; and which would be hurtful to the *embryo*, on account of its ſmallneſs, in the firſt months.

It is not ſufficient to diminiſh the quantity of food: but it is further proper, to attend to the choice of that which the women are permitted to have. Sweet aliment, eaſy to be digeſted, and affording a good juice, ſhould be preſcribed: as diſhes of tender fleſh, roaſted or boiled; young fowls; rabbits; pigeons; fiſh fried, or boiled; and particularly ſoop of rice and *ſemoule*, made with fleſh. Soop made only with herbs; ſalt meats; ſpiced diſhes; ragouts; pies; raw fruit, eſpecially if it be not ripe; ſhould be forbid. But it may be proper, to relax the ſeverity of this *regimen*, in the caſe of thoſe who have been habituated to live highly; and find themſelves in health. Pregnant women may be permitted to drink wine, or beer, if they be accuſtomed to it. It will be ſhewn below, that it is proper to exerciſe great indulgence with regard to *regimen*, at the beginning of pregnancy; ſo long as the ſickneſs, or diſguſts ſubſiſt.

It is proper to let women with child ſleep nearly in the ſame manner they do when they are not ſo. If they do not ſleep enough, it is proper to give them ſome ſlight anodyne: as an emulſion of almonds; the decoction of the heads of poppies; half an ounce of ſyrup of diacodium; or a little theriaca.

On

On the contrary, if they ſleep too much, they ſhould be reſtrained from eating ſo great a quantity; or ſhould be let blood.

It is nearly the ſame, with regard to the proper degree of exerciſe. Ordinary women, eſpecially peaſants, uſe much; and have eaſy pregnancies and deliveries. It is proper, nevertheleſs, to exhort them not to work too much; and particularly not to lift heavy burthens, or to ſtrain themſelves too much. Other women ſhould be adviſed to uſe it moderately, at leaſt: and not to keep laid down on a couch all the day: except, nevertheleſs, in the firſt months of pregnancy, when the after-birth, ſcarcely adhering to any thing, may be eaſily looſened, if a little too much motion, or a falſe ſtep, force open the orifice of the *uterus*. It is proper, likewiſe, to except from this rule, women, who are young, very delicate, or weak in the back: eſpecially, if they have ever before miſcarried in the ſecond or third month: and, far from exciting them to ſtir, it is neceſſary to oblige them to keep laid down on a bed, or on a couch, during the whole of pregnancy. They ſhould, in the mean time, be forbid to wear whale-bone ſtays; or any thing which may compreſs the belly too much.

Moderation ſhould be alſo obſerved in the cohabitation with the huſband. It would be good to abſtain from it, for the two firſt months of pregnancy; and till the after-birth be affixed to the *uterus*. But after that, I do not think it neceſſary to be ſo ſevere: though I condemn exceſs, nevertheleſs.

The paſſions of the mind, as anger, fretting, fear, and grief, when they are ſuffered to be too violent, may hurt the health of the *embryo*; and often cauſe abortion, in the beginning of pregnancy. It is proper, therefore, to adviſe women with child, to reſtrain themſelves: and, what is ſafer, to avoid all occaſions, where they may be affected in a lively manner.

II. As

II. As to remedies, thoſe which there is occaſion to employ in pregnancy, without any extraordinary accidents, are bleeding; purging; ſome ſtomachics; and, on certain exigences, ſome cordials.

It is not a long time, ſince bleeding has been conſidered as the moſt certain cauſe of a miſcarriage. Hippocrates had ſaid ſo; and all the world believed it on his word. It is quite otherwiſe now: and experience has triumphed over the authority of Hippocrates. There was a neceſſity to bleed women on ſome urgent occaſions: and no bad accident followed it. On the contrary, the patient was relieved by it: which gradually encouraged others; and bleeding is, at this time, as much recommended in pregnancy, as it was decried formerly.

This practice is very agreeable to good theory. The *plethora* of children is one of the cauſes, which often deſtroys them in the womb of their mother. The *plethora* in the mothers is the moſt common cauſe of the diſeaſes, which are incident to them. Bleeding, which removes this *plethora*, is therefore uſeful, both to the mother and child: which experience has confirmed. After bleeding, the mother is more light and gay: and the child moves more lively; which is a proof, that it is better.

The number of bleedings proper in pregnancy, vary according to the circumſtances and manner of living of the pregnant woman. It is not proper to bleed, or but ſparingly, in the caſe of peaſants, or working women, who eat little, and uſe much exerciſe: and who are not of a plethoric habit. On the contrary, it is proper to bleed the women, who live well, and lead a ſedentary life; and who have a *plethora*. It is uſual to repeat the bleeding thrice: at the third month; at the ſixth; and at the ninth. But at other times, when there is leſs occaſion, it is done only twice; or but once; and then the quantities not more than nine or ten ounces. I have met with women, whom it was proper to bleed, ſix or ſeven times: but the quantity

tity in ſuch caſes was ſcarcely more than five ounces: and it was, by this means ſolely, that they could have gone to the end of their time.

Theſe bleedings are made in the intervals of time, in which the *menſes* ſhould appear out of pregnancy. They ſhould be made in the arm. But if the woman have any diſeaſe that requires bleeding in the foot, as an apoplexy, or violent affection of the brain, it ſhould be performed there: and I have had the opportunity of practiſing it twice with ſucceſs.

As to purging, it was formerly as much feared, in the caſe of pregnant women, as bleeding. But that fear is vaniſhed: and it is practiſed now without ſcruple; although leſs frequently than bleeding. In general, ordinary women, who work, eſpecially peaſants, have not any need of bleeding: and it is very rarely there is a neceſſity to order it in their caſe. As to independent women, who uſe no exerciſe, or but very little, it is abſolutely proper to have recourſe to it, when it is perceived, their ſtomach is charged with the remains of many bad digeſtions: which is the caſe, particularly, with women who are delicate; cacochymic; who have a bad digeſtion; or who obſerve no rule in their diet.

It is common to purge women twice in the courſe of their pregnancy: at three months and a half, in order to carry off all the foulneſſes, that may have been collected in the ſtomach, during the time of the diſguſts, and longings: and in the ninth month, to render the labour more eaſy; and prevent bad conſequences. Purges may be given alſo three times; in the third, ſixth, and ninth months. Theſe purges are generally ſlight, with rhubarb; the vegetable ſalt, or the *ſal de duobus*; and manna, or caſſia. But, if the women with child are difficult to be purged, a dram of the infuſed follicules of ſena may be added.

Stomachics have always been employed in pregnancy: particularly in the caſe of women, who eat much;

much; who have taken improper food; or who have naturally a bad ſtomach. Among a great number of ſtomachics, rhubarb, bark, coral, or crabs eyes, powdered, are choſen: and this may be taken ſeparately, or two together, in the doſe of ten or twelve grains of each: being often repeated: common *elixir proprietatis*, of twelve or fifteen drops, in a ſpoonful of wine, may be alſo uſed: or diſtilled *elixir proprietatis*, in the doſe of a tea-ſpoonful, mixt with two tea-ſpoonfuls of common water, or orange-flower water ſimply, in the doſe of one or two common ſpoonfuls.

Cordials are ordered only in the caſe of ſuch a ſickneſs, as may occaſion a fainting fit. When the ſickneſs is ſlight, two or three ſpoonfuls of Alicant wine may be taken; or one or two ſpoonfuls of double balm water, commonly called *L'eau de carmes*, mixt with equal parts of water: the confection *hyacinthi*, or *alkermes*, in the doſe of half a dram, or more, diluted in two ſpoonfuls of old wine: and even thirty or thirty-five grains of *theriaca*, diluted, likewiſe, in two ſpoonfuls of wine. But if the ſickneſs appear ſtronger, there ſhould be immediately ordered a potion, with the diſtilled waters of *carduus benedictus*; to which, ſhould be added theriaca, orange flower-water, or *eau de carmes*; and *lilium*, as many drops as may be judged neceſſary.

## § II. *Of the diſorders proper to pregnancy; and the means of remedying them.*

### DESCRIPTION.

Theſe diſorders are in a great number. From the beginning of pregnancy, to the end of the third month; and even to the beginning of the fourth, pregnant women are ſubject to diſguſts at common diſhes; to odd longings for things improper for them to eat; and ſometimes even for abſurd things;

to

to heart-burnings, and ſickneſſes; to frequent vomitings, and ſhootings or pains in the bowels; to oppreſſions, and palpitations of the heart; to ſwellings of the belly, attended with pain; to purgings; to head-achs; and, in a particular manner, to the tooth-ach.

Towards the fifth and ſixth month, come on pains of the loins, and hips; and hæmorrhages by the noſe, piles, or the *vagina*.

In the laſt months of pregnancy, women with child are coſtive; have frequent occaſion to make water; which terminates ſometimes in a ſuppreſſion, or retention of urine; the inferior extremities, and even the *vulva*, become œdematous; the legs are weak; *varices* ariſe in the legs, and the thighs; and, at laſt, the ſkin of the belly chops, and cracks.

Theſe diſorders are not the ſame in all women; neither with reſpect to number, or degree. Women, naturally of good health, who are active; who work; who live moderately; and who obſerve a proper regimen on the occaſion; perceive very little of them. They are conſiderable only in women of a delicate conſtitution; who eat much, or who keep to no rule in their diet; who lead an idle life, uſing no exerciſe; or more particularly, who are cacochymic.

It is very rare; or, to ſpeak more properly, it is without inſtance, that all theſe diſorders happen to the ſame woman. They are, for the moſt part, variouſly, and unequally divided.

## CAUSES.

We have already ſeen above, *Book* I. that the greateſt part of the diſorders, which happen to women, during the firſt months of pregnancy, happen alſo when the firſt eruption of the *menſes* is made with difficulty, *Chap.* III; when the *menſes* are diminiſhed, or ſuppreſſed, in women of greater age, *Chap.* X; or when they are retained, *Chap.* V: and care

care has been taken, in all theſe places, to explain the cauſe. To avoid an uſeleſs repetition, therefore, I ſhall content myſelf here, with pointing out ſummarily, the particulars of theſe cauſes which relate to pregnant women: and attention ſhall be had, to conſider there minutely thoſe of the other diſorders, which are peculiar to pregnancy. But in treating of theſe ſeveral diſorders, we ſhall begin, by diſtinguiſhing them into three claſſes, according to the three periods of pregnancy.

I. Two changes happen to women with child, in the two or three firſt months of pregnancy. The firſt is, the augmentation of the volume of the blood: which is occaſioned by the retention of the *menſes*. Hence the veſſels being more full, the circulation of the blood becomes ſlower; becauſe the frictions are ſtronger: the thickening of the blood increaſes; becauſe it circulates ſlower, and is leſs attenuated: and the ſecretion of all the humours is leſs abundant; becauſe, other things being ſuppoſed equal, it is always proportionable to the quickneſs of the circulation.

The other is, the ſuperabundance of the milky lymph in the *uterus*; which, no longer flowing conjunctively with the blood in the time of the *menſes*, regurgitates in the veſſels. As this lymph, after having circulated ſome time with the blood, mixes gradually with the humours, that are analogous to it; ſuch as the milky lymph of the breaſts; the *ſaliva*; the ſtomachic lymph; the lymph of the *pancreas*; and the lymph in the inteſtines; it gives riſe to ſeveral diſorders.

It reſults from thence, on one hand, that the ſlowneſs of the circulation, and the thickening of the blood; which, as has been ſaid, happen in the firſt months of pregnancy; are the cauſe why the blood ſtagnates in the parts: particularly in thoſe, which are ſoft, and have little elaſticity: as in the brain; which produces the head-ach, or *cephalalgia*:

in

in the ſpungy ſubſtance of the gums; which produces the tooth-ach, or *odontalgia:* and in the lungs; which cauſes an oppreſſion, and even palpitation of the heart, that comes from the blood's paſſing difficultly from the right ventricle, into the left ventricle, through the lungs, which are ſurcharged. The two ſame cauſes produce the ſlowneſs and ſmallneſs of the pulſe, in the beginning of pregnancy.

On the other hand, it follows, that the lymph of the breaſts, rendered thicker and more milky, by the mixture of the uterine milky lymph, ſwells the *veſiculæ* of the mammary body: and conſequently of the breaſt itſelf: which, being ſudden, cannot be effected without ſome pain: and that the *ſaliva*, depraved by the mixture of milky lymph, which grows viſcid, loſes its action and energy. This occaſions, that the common aliments appear inſipid; that diſguſts come on; and alſo longing for a thouſand things, which are odd, but proper to correct the *ſaliva:* and that the lymph of the ſtomach, vitiated by the ſame cauſe, is no longer proper to digeſt the food; and the more, as nothing is taken but odd and abſurd aliments, very little proper to be digeſted. Bad digeſtions will, therefore, be conſtantly produced: which, by irritating, and ſtimulating the bottom, ſides, and ſuperior orifice of the ſtomach, cauſe languors; oppreſſions; pain at the heart, or *cardialgias*; ſickneſſes; and vomitings.

At laſt, the little of unconcocted matter, and acrid and undigeſted chyme, which paſſes from the ſtomach into the inteſtines; being ſtill more changed there by the pancreatic and inteſtinal lymph, which are themſelves vitiated; irritate and corrode the nervous coat of the inteſtines; and cauſe ſhooting pains of the bowels, and a flux of the belly.

Of theſe ſeveral diſorders, thoſe which depend on the *plethora* of blood, are the moſt conſiderable, and

and worſt in women naturally ſanguine, habituated to copious *menſes*, great eaters, and indolent. They are, on the contrary, ſlight, under the oppoſite circumſtances. The diſorders, likewiſe, which ariſe from a *plethora* of the milky lymph of the *uterus*, and its mixture with the humours analogous to it, are more violent in cacochymic women: whoſe blood is bilious, and acrid; becauſe the lymph, in circulating with the blood, contracts thoſe depravities; which it communicates to the humours commixt with it: whereas they are much ſlighter in women, who have blood that is pure and ſweet; becauſe the uterine milky lymph, although blended with the blood, does not contract the depravity; or, but in a ſmall degree.

II. Theſe diſorders ceaſe of themſelves, at the end of three months of the pregnancy; or at the beginning of the fourth: becauſe the cauſes, which give riſe to them, ceaſe; or, at leaſt, diminiſh much: the *placenta* being then conjoined to the *uterus*, the veinous *appendices* depoſit there a part of the blood of the mother; which diminiſhes the *plethora* of blood: the vermicular, or lactiferous veſſels, depoſit there, at the ſame time, the milk they are full of; which diminiſhes the *plethora* of the milk: and theſe diminutions of both plethoras are in proportion greater, as the *fœtus*, which is become bigger, demands a more abundant nouriſhment.

Towards the middle of pregnancy, the *fœtus*, then grown large, dilates the *uterus* forcibly: which embraces it too cloſely: in women, where the *uterus* is naturally large; or at leaſt ſupple, and eaſily diſtenſible; this dilatation is made without pain: but in thoſe, where the *uterus* is ſmall, denſe, and not eaſily diſtenſible, the dilatation cannot be effected without pain: and conſequently cauſes a bearing down, attended with pain; which the women place in the loins, hips, or navel; according to the poſi-

tion of the parts of the *uterus* againſt which the *fœtus* acts moſt.

At this time, the *uterus*, filled with a *fœtus* already become large, compreſſes the trunk of the *aorta deſcendens*, on which it weighs; and, diminiſhing thus its cavity, hinders the blood from flowing through it ſo freely, as in common: which occaſions it to paſs more copiouſly into the ſuperior branches of the *aorta*, that carry it to the head. Whence ariſes the aggravation of the head-ach, the tooth-ach, and the bleeding at the noſe.

The *uterus* then, compreſſes ſtill more ſtrongly the interior hæmorrhoidal veins: which cauſes the piles with an effuſion of blood. On the ſame account, the compreſſion, which the veins, that come from the *vagina*, ſuffer, makes the capillary ramifications of theſe veins, in conſequence of being too full, burſt; and effuſe the blood through the *vagina*.

III. The *uterus* continues to grow bigger: and the obſtacles, which it gives to the circulation of the blood in the inferior parts, augments in proportion. The iliac veins, that carry back the blood from the thighs and legs; and the trunk of the *vena cava aſcendens*, where theſe veins reunite; are compreſt by the volume of the *uterus:* which retards the return of the blood from the extremities; and gives riſe to the ſwelling of the branches of the veins, where the blood ſtagnates: which renders them varicous on the ſkin of the thighs and legs, where they are ſuperficial.

The lymphatic veſſels formed by the reunion of the lymphatic veins, at the inferior extremities, are compreſt by the *uterus* in the baſon through which they paſs: whence the return of the lymph is intercepted, or retarded. This gives riſe to the *oedema* of the inferior extremities; to which the abundance of *ſerum*, which the blood that ſtagnates there

there lets go in the varicous veins, contributes much.

Women, at the end of pregnancy, have their legs more weak, and their feet leſs firm: which occaſions their being ſubject to ſtumble. This weakneſs comes, either from the ſwelling of the legs, and feet, which renders thoſe parts more clumſy, and leſs flexible; or becauſe they receive leſs animal ſpirits than ordinary, on account of the compreſſion, which the crural nerves ſuffer, in the baſon, by the effect of the *uterus*.

To conclude, in the laſt months of pregnancy, moſt women are coſtive: which comes from the compreſſion, that the *uterus* makes on the *rectum*. They have frequent occaſion to make water: becauſe the impreſſion of the *uterus* in the bladder renders it incapable of containing much urine. Laſtly, they have even ſometimes a retention of urine, when the ſwelling of the ſubſtance of the *uterus* communicates itſelf to that of the bladder; which Mr. Littre found *, in pregnant women, three times as thick as in a natural ſtate.

## *Of the ſymptoms; the diagnoſtic; and the prognoſtic.*

I. The diſorders of pregnant women are the ſymptoms of pregnancy: and I know no other ſymptoms, which depend on it.

II. With regard to the diagnoſtic, the exiſtence of theſe diſorders preſents itſelf to the ſenſes. In all conjunctures, thoſe who ſee them, cannot be ignorant of their nature. So ſoon as it is known the woman to whom they happen is pregnant, the real caſe is diſcovered: which is ſufficient to diſtinguiſh them from all other ſuch diſorders, in any different caſe.

* Memoires de l'Academie, *ann.* 1701, *pag.* 299.

III. The prognoſtic is pretty certain. 1° Commonly theſe diſorders are free from any bad conſequences. They ceaſe of themſelves at the end of three months; or the beginning of the fourth; as has been ſaid before.

2° On ſeeing a woman have ſuch diſguſts, as to refuſe all common victuals; eat only ſtrange unwholeſome things; be affected with languors and oppreſſions of the heart, even to fainting; be always ſick; and have vomitings almoſt continually; one would deſpair of a recovery; if not accuſtomed to ſee ſuch caſes. Nevertheleſs, the child keeps in health; and, as ſoon as the ſtorm is over, both it and the mother get the better of the illneſs, and become hearty.

3° It is proper to endeavour the mitigating theſe diſorders, when they are violent: but it ſhould not be attempted to cure them. There is great reaſon to believe, ſuch an attempt would not meet with ſucceſs: and the patient would only be fatigued with the means. But if it was to ſucceed, it would do great harm: becauſe the humours, which are evacuated by vomiting, being retained, would occaſion a fever.

4° It is proper to caution the pregnant women, not to abuſe the privilege they have of eating odd things: but care muſt be taken not to conſtrain them, ſo far as to hinder their obtaining what they long for. They would, in that caſe, fall into melancholy, that would be fatal to the child, as has been more than once experienced.

5° Since pregnant women have been bled and purged, their diſorders have diminiſhed much; and thoſe which are found ſtill to remain, do not reſemble the deſcriptions the antient phyſicians have left us.

*Method*

### *Method of cure.*

No attention is neceſſary, as has been before obſerved, to the diſorders of pregnancy, except when they are very great; nor yet even in that caſe, in any view but to diminiſh and mitigate them, without undertaking to cure them. In this light, however, I ſhall propoſe methodically, the remedies, that ſhould be employed for each of them.

I. In order to mitigate the diſguſt to common victuals, and the irregular deſires for other things, are to be employed, 1° Abſorbents: ſuch as coral, crabs-eyes, and *terra japonica*, in the doſe of twelve or fifteen grains, made in a bolus, with a little *confectio hyacinthi*.

2° Simple ſtomachics: ſuch as rhubarb, bark, caſcarilla, caſſia lignea, or gentian root, powdered, in the doſe of ten or twelve grains, diluted with ſome ſpoonfuls of warm water; or made into a bolus, with a little ſyrup of worm-wood.

3° Stomachics ſomewhat ſpirituous: ſuch as orange-flower water, or *eau des carmes*, in the doſe of one or two ſpoonfuls, pure, or mixt with a little water. Common *elixir proprietatis*. in the doſe of twelve or fifteen drops, in a ſpoonful of wine; diſtilled *elixir proprietatis*, or *carus*, in the doſe of a tea-ſpoonful, mixt with twice as much water. *Confectio hyacinthi*, or *confectio alkermes*, in the doſe of half a dram, in a ſpoonful of wine.

If they vomit much, and eat little, ſome ſpoonfuls of Alicant wine, with a little biſcuit; ſome ſpoonfuls of other white, or red wine, with ſugar, and grated nutmeg; a toaſt, with half wine and half water, and a little ſugar and cinnamon; or a diſh of chocolate, with one vanella in the pound; may be given to nouriſh them.

Laſtly, if theſe diſorders continue, and weaken the patient, ſhe ſhould be bled in the arm, eight or

nine ounces; or purged with rhubarb, *ſal de duobus*, and manna. The ſtomachics before propoſed, ſhould then be uſed: and a grain of *ipecacuanha* in powder, mixt with twenty, or twenty-four grains of *theriaca*, may be given in the morning for ſome days.

III. In the ſhootings and pains of the bowels, an ounce of oil of ſweet almonds, mixt with a third of ſyrup of marſh-mallows, or of lemons, is given by the mouth, a little at a time; or one, or two cups of infuſion of camomile flowers, made into tea; to which is added, orange-flower water. Clyſters, with the decoction of tripe, and oil of ſweet almonds, may be uſed: and fomentations in the belly, made with emollient decoctions. And, laſtly, purges may be adminiſtered.

IV. Nearly the ſame remedies are employed in the flux of the belly; to which, are added clyſters, with broth of tripe, and the yolk of an egg: abſorbents mentioned above, *Art.* I. a grain or two of *ipecacuanha*, mixt with a bolus of twenty-four grains of *theriaca*. Half a dram of *diaſcordium* ſhould be taken, and in the evening, the *decoctum album* given for the common drink. The patient ſhould be fed with lentil ſoop, boiled with broth, or with freſh eggs. Laſtly, ſhe ſhould be purged with the magiſterial ſyrup, in the doſe of one or two ounces; or the double *catholicon*, in the doſe of ſix drams, or half an ounce.

V. In the head-ach, palpitations of the heart, and tooth-ach; or the painful ſwelling of the breaſts; recourſe may be had to bleeding: to which, may be joined, for the tooth-ach, a *laudanum* plaſter on the temples; frequent gargariſms of warm water, with a little aquavitæ; and the uſe of the anodyne tincture, in the doſe of twenty drops, to procure a mitigation of the pain: or laſtly, the tooth may be drawn; which may be done though in pregnancy; at leaſt, if the patient be not believed

lieved to be too much apprehenſive of the pain of this operation. With relation to the painful ſwelling of the breaſts, it may be remedied by rubbing them with the marrow of beef; or, what is better, the oil of ſweet almonds: which has no ſmell.

VI. There is nothing to be done for the pains of the loins and hips, which is never very violent. But, in order to amuſe the women who complain of them, Madam Fouquet's plaſter may be laid on the ſmall of the back.

VII. The hæmorrhages by the noſe, *vagina*, or the hæmorrhoids, may be checked by bleeding in the arm: and there may be given, a decoction of comfrey; to a pint of which, is added fifty-five drops of *Rabel*'s water, with three ſpoonfuls of the ſyrup of capillaire. Three glaſſes of this ptiſan, each of five or ſix ounces, ſhould be given every twenty-four hours, till the cure take place. But, if the hæmorrhage come from the *vagina*, or the internal hæmorrhoidal veins, little warm injections may be made with the decoction of the leaves of plantain, in which dragons blood has been boiled; or with the ptiſan above-mentioned.

VIII. Coſtiveneſs demands much attention in pregnancy. It muſt be prevented, or quickly remedied, by giving oil of ſweet almonds; broths of veal with beets and ſpinage; coffee boiled, in the doſe of three drams; half clyſters, with beets: to which is copiouſly added, freſh butter, or two drams of white ſope, or an ounce of lenitive electuary.

IX. A frequent irritation to make water muſt be borne with; and whey muſt be taken: or the infuſion of linſeed, become cold, muſt be drunk, as the common liquor. But if a retention of urine come on, it is proper to uſe the catheter; and even leave it in the bladder: but happily this caſe is rare.

X. The only way of hindering the progreſs of the oedematous ſwelling, is, to keep in an horizontal poſition, in bed; or on a couch; which facilitates the return of the blood, that comes back from the inferior extremities.

XI. Weakneſs of the legs, in ſuch a degree as merits attention, does but happen to a few pregnant women. They, who perceive themſelves not to be firm on their feet, ſhould not walk, without being ſupported; in order to avoid falling: which might be attended with fatal conſequences. This inconvenience occurs only in the latter part of pregnancy: but it laſts to the end of it; and ceaſes of itſelf immediately after delivery.

XII. In order to hinder the cracking of the ſkin of the belly, it is proper to begin, from the ſixth month, to anoint it twice a day, with the marrow of beef; or, what is more proper, with oil of ſweet almonds; which may be perfumed with ſome drops of any proper eſſence.

## § III. *Of the precautions, which are proper to be uſed in the accidental diſeaſes of pregnant women.*

Women are ſubject, in the courſe of pregnancy, the ſame as in all other times, to diſeaſes in general; ſuch as to intermitting, continued, and malignant fevers; the ſmall pox; *eryſipelas*; pleuriſy; jaundice; aſthma; apoplexy; epilepſy, &c. Hippocrates * has decided a long time ſince, that all theſe, particularly the acute diſeaſes, were mortal in this ſituation; and this deciſion has been adopted by all the phyſicians, even to this time. There is no reaſon to wonder that Hippocrates, and the phyſicians who followed him, did not dare to employ, in the caſe of pregnant women, effectual re-

* *Aphor.* 30. *Sect.* V.

medies,

medies, capable of counteracting the cauſe of the diſeaſe. They confined themſelves to giving ſome inefficacious palliatives; or, to ſpeak more properly, left theſe diſeaſes to the force of nature only.

Now that phyſicians are more bold, they are a little more lucky: and have often ſucceeded in curing the diſeaſes, which have been regarded as mortal. It muſt, nevertheleſs, be granted, that all diſeaſes are more dangerous in pregnancy than any other time: becauſe they then almoſt always cauſe a forced abortion; that is dangerous of itſelf; which, conſequently, much augments the danger of the diſeaſe.

It is, therefore, no matter of ſurprize, if the moſt intelligent phyſicians are embarraſſed in theſe caſes; and do not know what meaſures to purſue. Should they give the efficacious medicines, that the mother's diſeaſe demands, they fear to kill the child: ſhould they attend to the preſerving the life of the child, they would be apprehenſive of neglecting the cure of the mother. Thus, in conſequence of theſe difficulties, and being willing to ſave both the mother and child, they ſuffer both to periſh.

It is neceſſary, in order to determine in ſuch difficult caſes, to know well the accommodative methods, that may be taken to cure the mother, without doing any injury to the child: and what is further of very great importance, to underſtand in what juſt degree to put theſe methods in practice. This I propoſe to explain in the preſent article. I ſhall ſay nothing of the treatment, that is proper in the different diſeaſes, which occur in pregnancy. It would be an abſolute digreſſion from the ſubject I treat of. But I ſhall diſplay the manner of treatment which ſhould be purſued in them; and the efficacious and energic remedies, *remedia Herculea*, which are proper in them. I ſhall advance nothing on a matter ſo intereſting, but what I have ſeen practiſed by the moſt

moſt able phyſicians, whom I have known; and what I have practiſed myſelf with ſucceſs.

I. Bleeding is one of the moſt powerful ſuccours, that medicine can employ in fevers, and inflammations, when there is room to apprehend, they may happen from ſurcharges of blood in the *viſcera*, in all floodings, &c: and it ſhould be employed, in all theſe caſes, even in pregnancy. Formerly nobody had the courage to do it: becauſe Hippocrates ſaid it would procure abortion. We have grown a little bolder at laſt: becauſe experiments, made through neceſſity, have taught us, that we may bleed pregnant women, not only without danger, but even with great benefit. A great timidity remains, nevertheleſs, yet; and it is only in our own time, the yoke has been at all ſhaken off, as to this article.

It is difficult to fix the number of bleedings, which may, or ought to be made, in the caſe of a pregnant woman. It depends on the nature, or violence of the diſeaſe; the ſtate of the pulſe, &c: and muſt, conſequently, be referred to the diſcretion of the phyſician. If the diſeaſe be violent, and urgent, at the beginning, one or two copious bleedings of ten or twelve ounces may be made: but, in every other caſe, it is better they ſhould be ſmaller, as ſeven or eight ounces: reſerving it, to repeat them oftener: which both the mother and child can more ſafely bear.

Theſe bleedings ſhould be in the arm, to avoid a derivation of blood from the *uterus*. Nevertheleſs, if the nature, or ſeat of the diſeaſe, ſo demand, it may be in the feet, without fear of any bad conſequence; if ſome bleedings of the arm be practiſed previouſly: which diminiſhes and almoſt intirely annihilates the revulſion. This is the proper courſe, in a *delirium*, apoplexy, or *eryſipelas* of the head or face, without being reſtrained by an idle fear.

fear. If bleeding in the foot would produce abortion, there would be no foundlings.

II. Hippocrates has not been ſo ſevere againſt the uſe of purges in pregnancy. He permitted them in * certain caſes, from the fourth month to the ſeventh. They have always, therefore, been employed more freely than bleeding. But phyſicians, who have conſtantly ſubmitted to his authority, have abſtained from them the three firſt, and the two laſt months of pregnancy. At this time being bolder, or more intelligent, they do not heſitate to purge women, whenever it is neceſſary, in the eighth and ninth months of pregnancy. They are a little more cautious in the two firſt months: becauſe then the *embryo* floats ſtill in the *uterus:* but if, in theſe two months, there be a preſſing occaſion to purge, they may and ought to do it with confidence: employing, nevertheleſs, only ſoft and gentle purgatives.

Such are the purges, which are ordered for pregnant women, compoſed of rhubarb, the vegetable ſalt, manna, decoction of tamarinds, and caſſia. There may, however, if the patient be difficult to be moved, be joined to the infuſion, one or two drams of the follicles of ſena. But the moſt proper conduct, in this laſt caſe, is to employ a ſlight royal ptiſan: which commonly purges very well, without harraſſing the patient.

III. The antients were very little acquainted with vomits and emetics. At this time they are much known; particularly the antimonial; and by preference the ſtibiated ſoluble tartar: and they are employed with great ſucceſs, in the cure of many diſeaſes. They are often adminiſtered in *l'avage:* that is to ſay, ſome grains of ſtibiated ſoluble tartar is diſſolved in warm water: which is given from half hour to half hour, in ſmall doſes, three hours after

* *Aphor.* 29. *Sect.* V.

a purga-

a purgative potion, to augment the effect of it. It may, with full assurance of safety, be employed, after this manner, in the case of pregnant women, in the dose of one or two grains, dissolved in seven or eight spoonfuls of water: giving one spoonful from half hour to half hour, when there is occasion to augment the effect of a medicine, that has been taken three hours before. The emetic tartar, given in this manner, operates little, or not at all upwards; but works downwards: to which it is determined by the action of the other medicine, whose effect it augments considerably.

The emetic tartar is often exhibited also, in the full dose: which is here at Paris, from three to four grains. This is the constant practice in a *delirium*; and apoplectic fits: in which it is necessary to procure a large evacuation: and, at the same time, give the patient a brisk shock. It cannot be denied, but that the child, already weakned by the disease, and by the remedies, may have its life brought into danger, when the emetic tartar is taken by the mother, in so large a dose. In vain, to remove the apprehension of it, is quoted the vomiting at the beginning of pregnancy, without any inconvenience to the child. The difference which there is betwixt the spontaneous vomitings, that nature brings on, and the forced vomitings, which are excited by irritating medicines, cannot be dissembled.

There is, nevertheless, sometimes, a reason for giving to pregnant women this dose of the emetic tartar, when they are in circumstances, where this remedy is necessary: and in which, there is just ground to fear, they will otherwise be lost, if that means be neglected. I have seen very prudent physicians take this course, without hesitation: and I have done the same myself with very happy consequences, both to the mother and child: but I have never done it without trepidation. In these cases,

caſes, one ought to be influenced by a ſuperior reflection; which will be found at the end of this article.

IV. It may not, perhaps, be eaſily imagined, that precautions are neceſſary to be obſerved in giving clyſters, to pregnant women, in their diſeaſes; but it is ſo, nevertheleſs.

1° Half clyſters only ſhould be given them, for fear that a whole clyſter, by tumifying the *rectum*, may compreſs the *uterus* too much; and do harm to the child; which is then weak. 2° No clyſters ſhould be given them, but ſuch as are emollient, with freſh butter, or oil of ſweet almonds; a dram or two, of white ſope; two ounces of mercurial honey; or, at moſt, an ounce of caſſia boiled. If a clyſter, with irritating drugs, which throw the inteſtines into contractions, were to be given, there would be reaſon to fear, that theſe contractions, extending themſelves to the *uterus*, which is contiguous, would occaſion an abortion.

V. Much attention muſt be had, in pregnancy, to the diet of the patient. On the one hand, the child, which ſhe has in her womb, requires, that ſhe ſhould be nouriſhed, in order to its being itſelf nouriſhed: and, on the other hand, the nature of the diſeaſe demands a regulation of the food. There is no way to get free of this embarraſſment, but by ſteering in the middle courſe. In chronical diſeaſes, where the patient is without fever; ſuch as the jaundice, aſthma, &c. it is proper to allow nouriſhment; and in a pretty large quantity. The ſame cannot be done in acute diſeaſes, attended with fever; and the fever itſelf often with paroxyſms. This would be to augment the fear; and, conſequently, the danger. It is proper, therefore, in theſe caſes, to keep the patient to broth, during the three or four firſt days; as long as the fever is violent. As ſoon as it is rendered moderate, by bleeding, a ſpoonful of creed rice, or French barley, diluted,

luted, may be given every day: or the yolk of an egg, in two or three baſons of broth: which will not augment the fever; provided this broth be taken in the intermiſſions.

VI. A cordial potion ſhould be always had ready, by way of precaution: of which, in caſe of exigence, two or three little ſpoonfuls ſhould be taken particularly after bleeding; and during the operation of purges, it is proper to take care, that this potion be not inflammatory. It ſhould be compoſed of diſtilled waters of mug-wort, *carduus benedictus*, and orange flowers, each one ounce; of barley cinnamon water, half an ounce; with a dram of the *confectio hyacinthi*, or *confectio alkermes* diluted in it: to which ſhould be further added, if it be thought proper, fifteen or twenty drops of *lilium*. Liberty may be alſo given to women, who are about the patient, to apply, in form of an epithem, to the pit of the ſtomach, or the navel, a cruſt of bread toaſted, and dipt in Spaniſh, or Alicant wine; on which has been ſpread ſome *confectio hyacinthi*.

I ſhall finiſh this article with a very important reflection, which phyſicians, who have the care of pregnant women, ſhould have always in their view: and which ought to guide them in their conduct. It is, that, as long as a reaſonable ground of hope remains of ſaving the mother, by gentle, innocent, mild medicines, which can do no hurt to the child, they ought to keep to ſuch a method, without the leaſt deviation from it. But, if the mother be dangerouſly ill; and there be juſt cauſe to believe ſhe will die, if a more efficacious method be not employed, though at the riſk of the child, regard ſhould then be had to the mother only: who ſhould be treated as if ſhe was not with child: nothing ſhould be ordered on purpoſe to kill the child, and free the mother from it, which would be a puniſhable crime: but every thing ſhould be preſcribed for the mother, that is moſt efficacious, without

without being reſtrained by any conſideration for the child. Nothing can be more prevalent, than the reaſon for this conduct. If the mother dies, the child dies with her: and both will be loſt. Whereas, in endeavouring to ſave the mother, a chance is procured of ſaving at leaſt one: and both may, perhaps, by this means be ſaved; as examples have ſhewn.

## CHAP. XI.

### *Of the natural time of labour, and delivery.*

I Debated with myſelf, a long time, whether, or no, I ſhould treat on this head. I had repugnance to ſhewing the exceſs of credulity of many phyſicians, antient and modern, whoſe capacity and knowledge in other matters, I hold in eſteem. But as this queſtion is important, and gives riſe to frequent diſputes, I thought I could not diſpenſe with being ſilent about it. It appeared to me, that it was become time, to fix the period of parturition and delivery, hitherto in too much uncertainty; and to ſet phyſic free from all the fabulous obſervations which diſhonour it. In order to do this, with due method, I ſhall divide this chapter into two articles. In the firſt, I ſhall eſtabliſh the principles, on which the queſtion ought to be decided: and, in the ſecond, I ſhall examine what degree of belief, the contrary obſervations merit; of which, it ſeems to me, they have made too great account.

§ I. *Of*

## § I. *Of the principle, which ought to fix the juſt term of parturition and delivery.*

I. Nature, who is conſtant in her operations, works always by rule and meaſure. There is neceſſary, in trees, a certain interval betwixt the time in which they bear their flowers, and that of the maturity of their fruits: and this interval is always nearly the ſame in the trees of the ſame kind. There is, alſo, in the ſame manner, a certain time neceſſary, in order that ſeeds put into the ground ſhould come up; and that, after they are come up, they ſhould riſe to ſeed: and this time is, likewiſe, nearly the ſame in the ſame kind of plants. The eggs of oviparous animals, however, have occaſion to be ſat upon a certain number of days, in order to be hatched: and this number ſcarcely varies at all in thoſe, which are of each kind of oviparous animals.

The ſame regularity is obſerved in the time of viviparous animals. The females bear their young for a certain period, from the conception to the delivery. Mares, and aſſes, go conſtantly eleven months: cows, ſwine, ſheep and goats, five: bitches ſixty days; and hares and rabbits thirty. But in all theſe females, the time of delivery is nearly the ſame in each particular of the ſame kind, according to their ſpecies.

The pregnancies of women ought to follow the ſame order: and we ſhall prove below, that they do follow it. But we do not propoſe, to prove it here; except by the conſideration of the uniformity of nature in all her works. Can we believe, that God, the Author of nature, whoſe will it has been, to regulate the parturition of all animals, has neglected that of the human kind, which appears to have been the principal object of his attention, ſo as to leave uncertain the time of the birth of man? and, unleſs

unleſs we be blinded by prejudice, muſt we not grant, that, ſince the time of the delivery of all animals has a regulated period, the pregnancy of women muſt have one likewiſe.

Such has been, in all ages, the opinion of every known country. It was thus believed among the Jews, Greeks, and Romans. It is thus, that, at preſent, all the nations of the four parts of the earth think, in ſpite of the difference of climate, diet, and exerciſe. Such conformity among nations, who have no intercourſe with each other, can be only the effect of a common obſervation: and muſt be conſequently regarded, as a proof of the truth of the opinion, which we maintain. * *Omnium conſenſus naturæ vox eſt.*

II. However determined may be the time of delivery in women, it muſt not be believed to hold good to a minute: and that any-body could, provided there was a certainty of the hour of conception, predict the hour, and minute of delivery; as thoſe of an eclipſe may be predicted. The time ſuffers variations, not only in the delivery of different women, but even in the different deliveries of the ſame. We ſhall ſee, when we have explained the cauſes of delivery, how many cauſes of variation may occur in general. Thus, in order to conform to the motions of nature, it is proper to allow, with reſpect to women, a certain extent or latitude; that comprehends all theſe variations: which, indeed, do not deviate much from the general period.

It is commonly believed, that theſe variations are found in women only: but it is a miſtake, they are obſerved, in the ſame manner, with regard to other animals: and it is more eaſy to obſerve them there than in women: becauſe it is more eaſy to be certain of the time of conception of brutes. Thus

* Cicero. *Tuſculanar.* l. 35.

I am certain, that cows, to count from the time they take the bull, are delivered at the full end of the ninth month: but on different days: ſome the ſixteenth, and eighteenth; and others, the fifteenth, or twentieth.

In this calculation, the months are counted only thirty days; and they were reckoned formerly in the ſame manner. Thus the nine months, at the end of which begun the term of the natural delivery of cows, make two hundred and ſeventy days: and the ten months, which comprize this term, are three hundred days. So that the latitude, or extent of variation of this term, is thirty days. To count the months as they are reckoned at this time, when the year conſiſts of three hundred and ſixty-five days; the difference would be, even for the ten months of pregnancy, only twenty-five days.

It is true, as far as we can be certain of it, that theſe variations are more frequent, and greater, in women than in brutes: and there may be ſeveral plauſible reaſons aſſigned for it: women eat various kinds of food, variouſly dreſt: are ſubject to indigeſtions, more or leſs ſtrong, but frequent: give themſelves up often to violent paſſions of the mind: and cohabit with their huſbands throughout their whole pregnancy; which cannot fail to make different impreſſions on the child they bear; and muſt accelerate or retard the birth. Whereas, in the caſe of brutes, none of theſe cauſes ſubſiſt: inſomuch, that their young, in a quiet ſtate, exempt from all exterior agitation, may follow the common courſe of nature; and wait the ſtated time of delivery, without anticipating or exceeding it.

III. After having eſtabliſhed theſe two firſt truths, nothing more is wanting, in order to reſolve this difficulty, than to note what is the true period of pregnancy in women; and to fix what latitude, or extent of deviation, it is proper to allow it. If nothing

thing more be requiſite for that, than human teſtimony, and even ſuch as is reſpectable, theſe two queſtions would be ſoon decided. Hippocrates, the moſt antient author, who has written of this matter, remarks, in his treatiſe *De Carnibus*, towards the end, that the period of delivery in women, is nine months, and ten days; that is to ſay, it falls in the tenth month, *novem autem menſium*, ſays he, *& decem dierum fœtus editur & vitalis eſt.* He ſpeaks more clearly yet, in the treatiſe *De Naturâ Pueri:* where he ſays, that children are born in the tenth month; and that this is the longeſt term of their birth, *in decem menſibus, quod longiſſimum eſt, naſcitur fœtus.* And he endeavours to explain, ſome lines lower, why the child cannot remain in the womb of its mother longer than ten months. *Cur non longiore, quàm decem menſium ſpatio, fœtum utero geſtari contingat.*

This ſentiment of Hippocrates, on the period of pregnancy in women, is confirmed by the aſſent of all ages, and nations. Among the Hebrews, Solomon ſays, on the Book of Wiſdom, chapter VIII. that he has been formed, in the womb of his mother, during ten months. *In ventre matris figuratus ſum caro decem menſium tempore.* Among the Greeks, Menander, a dramatic poet, ſays, that the women are delivered in ten months. Γυνη κυει δεκαμηνος. It is, moreover, known that * Leotychides, ſon of Timea, queen of Sparta, was regarded as illegitimate, and deprived of the right of ſucceſſion to the crown; becauſe he was born in the abſence of king Agis; which had laſted more than ten months. Moreover, among the Romans †, Virgil profeſſes the ſame ſentiment, in ſaying, *matri longa decem tulerunt faſtidia menſes:* which is confirmed by the ſuffrage of Plautus ‡, Terence ||, and many other authors.

* Plutarch. *In Alexandro.*
† Bucolic. *Eclog.* IV.
‡ In Ciſtellariâ. *Act.* I. *Scen.* 3.
|| In Adelphis. *Act.* III. *Scen.* 5.

What is more prevalent yet, the Roman laws decided, on this principle, the legitimacy of children; and the right of inheritance. The laws of the twelve tables excluded, from all right to inheritance, children, who were born ten months after the death of the husband of their mother. The law, *Gallus de liberis & posthumis*, supposes this rule: and the law, *de suis & legitimis hæredibus*, established it, in the most formal manner, in these terms, *Post decem menses mortis natus non admittitur ad legitimam hæreditatem.* In the Code, lib. V. *Titul.* XXIX, the law, *Quidam cum Testamentum*, allows the same rule: and Justinian, in the new Code, XXXIX, chapter II. considers it as an inviolable law. A woman, who was married again, in the year of her mourning for her first husband, was brought to bed eleven months after his death, *undecimo mense perfecto.* The emperor decided, that this child could not belong to the first husband: because it was not possible, that the time of her pregnancy could extend so far. *Non esse possibile dicere*, says he in the new Code, *quia de defuncto fuisset partus, neque enim in tantum conceptionis tempus extensum est*; and, consequently, he condemns the mother to several punishments.

Almost all physicians, likewise, who have written on this subject, hold the same sentiment; and fix the same period: but not to charge the margin with useless quotations, I will relate a passage from Mercurialis, where that professor *, whose knowledge is well known, says, in express terms, *decimus mensis est verus terminus partus humani.*

So many authorities, in all ages; so many examples of all nations; so many laws, which have observed this rule in the Roman empire; must, one would think, suffice to decide this question. But

* De Morbis Muliebribus, *lib.* I. cap. III. De Molâ, *Artic.* Signa Molæ.

if

if there ſhould yet remain any doubt; and obſervations which are certain, and capable of fixing a poſitive determination, ſhould be denied; it would be eaſy for the king to procure them if he would, without deviating from the moſt juſt rules of morality. Nothing is more wanting than to take forty young married women, of a good conſtitution; and regular; and to ſhut them up in a houſe, where great care ſhould be taken to accomodate them properly. They ſhould be ſuffered to cohabit with their husbands; and to note the date. The date of their delivery ſhould be noted, likewiſe; and it would be known, by this means, with certainty, the time, the pregnancy of each would continue. Let this experiment be repeated, for four or five years; and there would be 150, or 200 obſervations: which might be depended upon: and which would ſerve as *data* for eſtabliſhing a rule in this matter. By this means, perhaps, 300 treatiſes, written on this ſubject, would be annihilated: and a greater number yet, would be hindered from appearing hereafter. For nothing is more written upon than thoſe queſtions; of which there is no means of ſolution. And, what is of more conſequence, thoſe odious proceſſes would be diſcontinued, with which, the courts of juſtice are ſo often embaraſſed, with regard to the ſtate of poſthumous children, where it is pretended, the delivery has been delayed.

## § II. *Of the credit, which ſhould be given to the obſervations that are produced to authorize protracted deliveries.*

It follows from what has been ſaid, in the preceding article, of the time of delivery in women, that none are legitimate, but what are within the tenth month of pregnancy; that all thoſe, which happen before the beginning of the tenth month, ought to be regarded as premature; and, conſe-

quently, as abortions, or miſcarriages; and that none ſhould be admitted after the end of the tenth month: which is, as has been ſaid above, the greateſt extent of the time, *quod eſt longiſſimum*, as Hippocrates has declared.

I foreſee all the obſervations, that can be brought againſt this opinion: and I know the authorities, which may be oppoſed to it. But I hope, that the ſummary examination, as the cauſe I am going to defend, does not demand a longer, will ſuffice to take away the advantage, that may be attempted to be gained from them.

I begin with Hippocrates, who is the moſt antient. We have ſeen, in the preceding article, that he decides, in the moſt poſitive manner, that the child does not continue longer in the womb of its mother, than the end of the tenth month; and that this is the longeſt time, *quod longiſſimum*. Nevertheleſs he ſpeaks, in the two treatiſes, *De Septimeſtri Partu*, and *De Octimeſtri Partu*, that appear to have been only deſigned for one treatiſe, of children born at eleven months, *Undecimeſtres*: which is, as appears, a palpable contradiction. It has been endeavoured to reconcile theſe two paſſages, by an ingenious comment *. The eleven months are made to begin at the end of one month; and to finiſh at the beginning of another month: theſe two broken months are reckoned for two months; which, added to the nine months that remain, make the eleven months.

It is ſuppoſed, for example, that the pregnancy begins the thirty-firſt of January; and that it ends the fifteenth of November: by reckoning both theſe two for intire months, *menſis inchoatus pro completo habetur*; and joining to them the interme-

* Jean Peyſſonel, *Of the Time of the Delivery of Women, according to Hippocrates.* See the Journal des Sçavans, *tom.* I. *ann.* 1666. *pag.* 455.

diate

diate nine months; it will be found, that the child will be born in the middle of the eleventh month: although it remained only ten months in the womb of its mother. It is in this ſenſe, Hippocrates has been repreſented, as ſpeaking of children of the eleventh month. But this reconciliation does not ſeem to me to juſtify him. Since, having ſpoken ſo clearly in one place, he would have been greatly wrong, to have employed expreſſions ſo obſcure, or at leaſt ſo equivocal, in another. I am more inclined to believe, that the treatiſe *De Septimeſtri Partu, & De Octimeſtri Partu*; in which he ſpeaks of children born at eleven months, are not his. It is known, that, in the collection of works attributed to him, there are ſeveral, which do not belong to him: and it is material to remark, that Erotien, who lived in the reign of Nero, and made a catalogue of the works, which were really, according to him, written by Hippocrates, has not taken in theſe two treatiſes.

Ariſtotle, who lived after Hippocrates, had, without doubt, read his works; and, as it appears, followed his ſentiments. He remarks*, "That "other animals have one fixed time, to bring forth "their young; but the human kind alone have "more; as women may be delivered the ſeventh, "eighth, and, what is moſt general, the tenth "month; ſome, ſays he, even attain the eleventh." *Cùm cætera animalia omnia ſingulari ac ſimplici modo partum ſuum perficiant, (unum pariendi tempus ſtatutum omnibus eſt) homini uni multiplex datum eſt, nam & ſeptimo menſe, & octavo, & quod plurimùm, decimo, nonnullæ etiam undecimum tangunt.*

It ſeems by this, Ariſtotle allows, that all other animals have a fixt determined time to be delivered of their young; but that women have various times; becauſe they are brought to bed the ſeventh and

* De Hiſtoriâ Animal. *lib.* VII. *cap.* IV.

eighth month, and more commonly the tenth; and that there are ſome, which go on to the eleventh: from whence it is evident, that the uncertainty, which Ariſtotle admits, in the delivery of women, regards only thoſe deliveries, made before the tenth month; and that, if he extends the time to the eleventh month, it is only to the firſt day of that month: ſince he ſays, that ſome go on to eleven months, *undecimum tangunt*.

As to Pliny, he followed Hippocrates, and Ariſtotle: and, conformably to their doctrine, he advanced *, that though other animals had a determined time which fixt their birth, man had not any, but was born the ſeventh and eighth month; and all the time which follows, even to the tenth, and beginning of the eleventh month. *Cæteris animantibus ſtatum pariendi & partûs gerendi tempus eſt. Homo toto anno & incerto gignitur ſpatio. Alius ſeptimo menſe, alius octavo, & uſque initia decimi, undecimique.* From whence may be properly drawn the ſame conſequence, as was before from the paſſage of Ariſtotle; that there is a term fixt for the birth of other animals; but nothing certain, or determined, with reſpect to men; who are ſome born the ſeventh, and others the eighth; and, in ſhort, at all times, to the tenth and beginning of the eleventh: which, as we ſee, bounds the time of the birth of men, to three months: the ſeventh, eighth, and ninth, that precede the tenth, and the beginning of the eleventh: but do not allow, that it extends further.

Nothing is found on this head in Galen: nor in the other Greek phyſicians, who have written ſince. But to make amends, how much do we find in the Arabian phyſicians †, who flouriſhed a long

* Hiſtor. Natural. *lib.* VII. *cap.* V.

† There may be applied to the antient phyſicians, what Cicero ſaid of the philoſophers, *Nihil tam abſurdè dictum, quod à quodam*

long time after; and particularly thoſe, who have written in Europe, ſince the re-eſtabliſhment of medicine to our time. The greateſt part, by perverting the expreſſion of Ariſtotle and Pliny, extended the uncertainty of the time of deliveries beyond the tenth month of pregnancy: and, from thence, have ſprung thoſe monſtrous obſervations of children quite alive, who were born the eleventh, twelfth, and thirteenth month: and alſo, conſequently, the twentieth, and twenty-ſecond month. Two * authors have even ventured to relate, that a woman, whom they named, was delivered at the end of the ſecond year of her pregnancy, of a child abſolutely alive, and in health. They have, moreover, alſo dared to add, that when it was born, it walked, and talked. It is to be wondered, that they did not ſay it was born with its cloaths on.

Compilements of the greateſt part of theſe obſervations are found in John † Schenckius; Adam ‡ Spigelius; Martin ‖ Schurig; and the greateſt part of the authors, who have written on this ſubject.

In order to ſhew the little credit, which ought to be given to theſe obſervations, I may produce the ſentiment, which many phyſicians, the moſt intelligent of our times, have had of this matter. I might even, to invalidate the proof, they would draw from them, examine them in detail: and ſhew the futility at leaſt of the greateſt part. But I

*quodam philoſophorum dictum non ſit.* What a compilation of abſurdities it would be, if what the antient phyſicians have ſaid of witchcrafts, moles, motions of the *uterus* in hyſterical paroxiſms, poiſonous quality of menſtrual blood, and of the ſignature of plants, had been collected.

* Albert Krantzius, *In confutatione Legum*, apud Marcellum Donatum, *De Medicâ Hiſtoriâ Mirabili. Lib.* IV. *Cap.* XIII.

Jean Aventin, *Lib.* V. *Annal. Boiorum*, apud Johannem Schenchium, *Obſerv. Medicinal. Lib.* IV. de Partu.

† *Obſerv. Medicinal. Lib.* IV. de Partu.

‡ De incerto *Partûs tempore.*

‖ Embryolog. *Sect.* VI. *Cap.* I. and II.

ſhall

ſhall readily give up theſe advantages: and the cauſe, I ſupport, will not ſuffer from it.

I confeſs, I ſhould be alarmed at the number of theſe obſervations: and I ſhould with difficulty conſider them all as falſe, if it had been phyſicians who had made them: or at leaſt, who had ſeen theſe pretended late born infants come into the world; that it might have been diſtinguiſhed whether it was in reality a child of ten, eleven, twelve, or thirteen months, &c. But phyſicians neither ſaw, nor examined, any thing about them. It was, from women, they had the whole of what was reported: for which reaſon, if phyſicians are blamable, it is only for having believed them, on too ſlight ground: and they are really wrong in this reſpect; as Diemerbroeck ſays *. But I ſhall carefully avoid, nevertheleſs, the acrimony of ſtyle † of a profeſſor at Leipſic, who exerted himſelf ſtrongly againſt theſe obſervations, and thoſe who publiſhed them.

It is ſaid, with reaſon, that it is neceſſary to be very intelligent, in order to make good obſervations. I am very much inclined to think, that phyſicians are ſo always. But I believe, at the ſame time, that women are never ſo: and, on the ſubject of the duration of their pregnancy, leſs than

* Verùm inania ſunt hæc omnia, *ſays Diemerbroeck, in ſpeaking of theſe obſervations*, nullis firmis rationibus innitentia, nullis veris experientiis probata; ſed è ſolis muliercularum verbis deſcripta, quibus nonnulli nimis creduli docti viri aliquod tomentum adjecerunt, ut quibuſdam rationum verosimilium fulcimentis hanc rem fulcirent, *Anatomes, Lib.* I. *Cap.* XXXIV. de Partu.

† Paul Amman, *Irenic. Num. Pompil. pag.* 62, *& ſeq.* Omnes illæ partûs differentiæ ab antiquitate in hunc uſque diem obſervatæ, nonniſi ex fungoſo vetularum cerebro, atque ecliptico veteranorum medicorum, utpote aniculis lippientibus plus ſæpiùs fidei, quàm par eſt, tribuentium judicio provenerunt.

André Ottomare Gœlicke, relates this paſſage, *Medicin Forenſ. Specimine* I. § 16. following Martin Schurig. *Embryologiæ Hiſtorico-Med. p.* 281.

in

in any other: as with regard to that, it is known, they are often deceived by ignorance; *falluntur errore*; and that they more often deceive others from reaſons of intereſt; *fallunt nequitiâ*: as we ſhall prove below.

I. Women are often deceived as to the duration of their own pregnancy; *falluntur errore*: becauſe they do not know how to diſtinguiſh the beginning: and go further back than is right. Let a woman perceive a ſuppreſſion of the *menſes* for two or three months, with a tumefaction of the *uterus*, in conſequence of ſome uneaſineſs of mind, or other ſlight cauſe, which ſhe is ignorant of; if ſhe become with child at the ſecond or third month of this ſuppreſſion, ſhe will date the pregnancy, as ſoon as ſhe perceives it, from the moment the *menſes* failed: that is to ſay, two or three months ſooner than ſhe ought. When ſhe is delivered, therefore, in the tenth month, as is general, ſhe will believe, and inſiſt on it, that ſhe is delivered on the twelfth, or thirteenth month. But theſe miſtakes are of no conſequence: and no attention is given to them, when they happen to a woman who lives with her huſband.

Hippocrates was acquainted with this caſe: and ſpoke of it, in this manner, in the treatiſe *De Natura Pueri*. *At verò, ſi quæ ultrà decem menſes utero gerere ſibi viſæ ſunt, (quod jam ſæpè audivi) eæ hoc, quem referam modo, fallunt*, (falluntur) *cùm uteri à ventre flatum ſuppeditante ſpiritu diſtenduntur & intumeſcunt. . . . tunc mulieres ſe concepiſſe exiſtimant. . . . quòd ſi poſt aliquot menſes cum viris congreſſæ concipiunt . . . harum rationum ac rerum ignaræ eo tempore ſe concepiſſe reputant, quo menſes ſuppreſſi erant, & uteri intumuerant.*

Ariſtotle * has made the ſame remark in the pregnancies longer than thoſe, which he believed to be

* Ubi Suprà.

eleven

eleven months: and he attributes them, in the same manner, to the error of the women, who mistook with respect to the beginning of their pregnancy. *Simili modo*, says he, *& qui diuturniores quàm undecimo menſe nati videntur, latere videntur. Latet enim mulieres conceptûs initium, ſi cùm ante inflatus fuerit uterus, ut ſæpe accidit, poſt coierint atque conceperint; hoc enim principium eſſe ſui conceptûs exiſtimant.*

II. Women seek to deceive, as to their pregnancy, on account of their interest; *fallunt nequitiâ:* and these cases are of more moment. They happen on two occasions. The first is, when a woman is delivered of a child in perfect health, eleven, twelve, or thirteen months after the absence, or death of her husband. We have seen above, the example of Timea, queen of Sparta; and many others might be related. But I shall content myself with citing one, that made a great noise in Germany, about a hundred years ago: and which a celebrated * physician published. Titius, for he has not thought proper to tell the real name, a soldier, and a person of distinction, went to the army, the twenty-second of July 1672. The year after, 1673. Julian, that is the name, which is given to his wife, went to meet him in the month of June; and was brought to bed of a male child, the twelfth of July following. Titius, who had not seen his wife of eleven months, and twenty days, refused to acknowledge the child; and to suffer it to be baptized under his name. The lady brought a thousand reasons to authorize so late a delivery, called to her support the physicians, divines, and midwives, who all deposed in her favour. At length she did so much, that the husband killed himself: and the affair subsided.

The second occasion regards the posthumous children, who come into the world eleven, twelve, and thirteen months after the death of the husband of

* Michael-Bernard Valentini. *Nouvellæ Medico-legales, Caſ.* III. *pag.* 37.

their

their mother. Theſe cauſes never happen without giving riſe to lawſuits difficult to be determined, and full of animoſity, between the wife, and collateral heirs of the dead perſon. It would be eaſy to decide the caſe by the principles we have eſtabliſhed: but it may, according to my opinion, be determined by a more ſimple reflection. Theſe caſes never happen, but after the death of the husband, who leaves a great fortune and no children; ſo that the inheritance goes to the heirs. There is no ſuch inſtances to be ſeen in poor families, where there is little to be gained by a late born poſthumous child. It is difficult, in this light, to avoid ſuſpecting, that the deſire of keeping poſſeſſion of an eſtate, which is in danger of being loſt, has a great ſhare in the birth of a poſthumous child, propoſed to be the heir; and that women knowingly deceive in ſuch caſes, on the ſcore of intereſt; *fallunt nequitiâ.*

I am well aware, that the judgments given on this queſtion, in favour of ſlow births, will be oppoſed to my opinion. Pliny relates, that * L. Papirius, Pretor of Rome, in conſequence of the maxim, that there was no certain time for the delivery of women, acknowledged, as legitimate, a child born thirteen months after the husband of its mother; and adjudged to it, in this view, the effects, which the father had left, to the prejudice of the ſubſtituted heir, who claimed them.

The emperor Adrian, as Aulus Gellius ſays †, decreed, in the ſame manner, that a child, born eleven months after the death of the father, was legitimate; contrary to the former deciſion of the law of the twelve tables: in which it was laid down, that children, born ten months after the death of the pretended father, ought not to be acknowledged as legitimate. Aulus Gellius, who relates theſe

* Hiſtoriæ Natural. *Lib.* VII. *Cap* V.

† Noctium Atticarum. *Lib.* III. *Cap.* XVI.

facts,

facts, adds, that the emperor did not pass this judgment, till after having consulted philosophers, and physicians.

There may be added some decrees of different courts, where they have acknowledged, as legitimate, and established in the estate of their fathers, children born a long time after the tenth month from the death of their fathers.

But what can be concluded from such judgments, of which we are ignorant of the circumstances? Either there might be evidence of facts capable of determining the judges; or they might be deceived by the decisions of the physicians; or, lastly, it might be, that the judges suffered themselves to be moved; and did somewhat from commiseration. These judgments, even should they be more numerous, can never change the laws of nature, which are constant and immutable; and which ought to serve as a rule to the judges themselves in this matter; when they are established.

Paul Zacchias, a learned physician, and celebrated jurisconsultus, whose *questions, medico-legales*, are so much known and esteemed, regretted in his time, 1630, that there were not principles sufficiently certain, with relation to legitimate births, to regulate the jurisprudence of tribunals. As things remain still nearly in the same state, it is to be hoped, that the magistracy, moved with such an irregularity, will procure the proofs, which have been mentioned to be made, in order to fix the most common time of delivery, to give this time all the extent and latitude, that the proofs demand; and to obtain, by this means, in the sequel, a certain and uniform jurisprudence with respect to this matter.

CHAP.

# CHAP. XII.

## *Of abortion, commonly called miſcarriage.*

### § I.

### DESCRIPTION.

WE have ſeen, in the preceding chapter, that the time of natural delivery, is the tenth month of pregnancy. The *fœtus* is not, before that time, ſufficiently formed: and has not a proper conſiſtence, to bear the effects of the air, and linen on the ſkin; and to perform without diſorder, the functions neceſſary to life, as reſpiration, ſucking, and the digeſtion of the milk, which it ſucks. It follows from hence, that premature deliveries, which happen in the courſe of pregnancy, and before the end of the ninth month, are true abortions: or as they are commonly called, *hurts*, or *miſcarriages*.

There are two ſorts of miſcarriages diſtinguiſhed, with relation to the time of pregnancy.

I. Thoſe which happen in the beginning, that is to ſay, in the firſt or ſecond month of pregnancy, are almoſt without any pain or labour; becauſe the fecundated *ovum* is yet ſmall: and they are not attended with any flooding, but with a lymphatic diſcharge, in a ſmall quantity: no milk coming from the breaſts. I know no reaſon why the *accoucheurs* call the *ovum*, which comes away then, a *falſe germ:* ſince it is, a real germ of a ſpherical figure, formed by the coverings of the *fœtus*; and of a greater or leſs ſize, according to the time of pregnancy; in which is a cavity, that contains the *embryo*, affixed by a little cord to the *placenta*. It is not always found; becauſe it is too ſmall; or becauſe

cauſe it is diſſolved in the lymphous *ſerum*, in which it ſwims.

II. The miſcarriages, which happen from the third month of pregnancy to the tenth, are attended with labour, more or leſs violent, according to the time of the pregnancy, when they happen: which determines the magnitude of the *fœtus*. They are ſucceeded by *lochia*, or floodings, ſometimes very copious. The woman, who has had the miſcarriage, is ſometimes even ſubject to a milk fever, when the miſcarriage happens in the laſt months of the pregnancy. Miſcarriages give riſe, likewiſe, often to inflammations of the *uterus*; the *fluor albus*; and ſchirrhuſſes, and ulcers of the *uterus*.

III. Theſe laſt miſcarriages muſt be further diſtinguiſhed into two claſſes. Into thoſe, which happen the third, the fourth, the fifth, and the ſixth months; the child being born dead; or, at leaſt, dying a ſhort time after its birth; and not being capable of living, *vitalis*. I know ſome inſtances have been related of children, at ſix months, who have lived; not to mention ſome of four or five months, which is ſtill leſs credible. But if theſe inſtances be true, we ought to attribute them to ſome miſreckoning of the mother.

In the other miſcarriages, from the beginning of the ſeventh month, to the end of it; from the beginning of the eighth month to the end of it; and from the beginning of the ninth month to the end of it, the children are capable of living. There are ſeveral real inſtances of thoſe of the ſeventh month; many more of thoſe of the eighth; and, as to thoſe, which are born in the ninth, a number of phyſicians conſider them as arrived at the full time; and perfectly qualified to live: and it muſt be allowed, that they are ſcarcely any way different from thoſe who come into the world at the end of the tenth.

IV. It appears thence, that there are two manners of reckoning the time of miſcarriages. Sometimes

times it is ſaid, that a miſcarriage is of two or three months: which is ſaying, that it has happened after the end of the ſecond month; in the courſe of the third; at the end of the third month, in the courſe of the fourth; and the ſame of the reſt. According to this ſignification, a miſcarriage of ſeven months is, that, which happens after the ſeventh complete month, in the courſe of the eighth: and a miſcarriage of eight months is, that, which happens after the eighth month, in the courſe of the ninth.

It has been formerly ſaid, that a woman has miſcarried the ſecond, or third month of her pregnancy; and it ſignified then, that the miſcarriage happened in the courſe of the ſecond month, or the third reſpectively. The ſame when it was ſaid, that a woman miſcarried the ſeventh or eighth months; that ſignified ſhe had miſcarried in the courſe of the ſeventh or eighth months: which, as we ſee, makes a difference of near a month. I apprehend this remark is properly made, in order to avoid a confuſion, which is too frequent, in counting the time of miſcarriages and pregnancy. It appears hence, that theſe two expreſſions, delivered at nine months, or delivered in the tenth month, ſignify the ſame thing.

## § II.

### CAUSES.

There are ſo many cauſes, which may produce abortion, that, in reflecting on them, one might be led to think, no child could do well. Many arrive, nevertheleſs, at the tenth month: and even the number of them is greater, than that of thoſe, which periſh in the courſe of pregnancy; whence it appears, that theſe cauſes, by being numerous, are not more frequent.

In order to give ſome regular arrangement to the great number of theſe cauſes, I believe it will be proper to make five claſſes. 1° Of thoſe, which come from the mother. 2° Of thoſe, which come from the *fœtus*. 3° Of thoſe, which come from the *placenta*. 4° Of thoſe, which have no relation to the mother, and *fœtus:* being purely accidental. 5° Of thoſe, which come from the wickedneſs of the mother, in ſome attempt to deſtroy her offspring. As the manner of action of the greateſt part of theſe cauſes is evident, we ſhall not dwell on them: but only mention them. We ſhall, however, inlarge more fully on thoſe, which require ſome explanation.

## *Of the cauſes, which ariſe from the mother.*

They may ariſe from four different principles. I. From the faults of conformation of the *uterus*. II. From the quantity, and quality of the blood and milk, which the mother furniſhes to the *fœtus*. III. From the diſeaſes, with which ſhe is attacked, and which occaſion the death or diſorder of the child. IV. From the paſſions of love, with which ſhe is agitated, and the lively impreſſions ſhe feels.

I. In order to judge of the faults of the *uterus*, which may occaſion abortion, it is proper to attend to all the qualities the *uterus* muſt have for bringing a living child into the world. The want of each of theſe qualities muſt be conſidered, as a ſufficient cauſe of abortion.

1° Therefore, it is neceſſary, that the *uterus* be large enough; or, however, dilatable enough, to contain the *fœtus*, when at its biggeſt ſize. If the *uterus* be ſmall, denſe, cloſe, and not diſpoſed to give way to the neceſſary diſtenſion, it cannot contain the *fœtus*; which, being too much preſſed, will periſh about the third or fourth month.

2° It

2° It is neceſſary, that the circulation of the blood be free in the *uterus*; in order to its being capable of furniſhing nutriment to the *fœtus*. This cannot be, if it be ſchirrhous; or full of tubercles, or indurations, which are the remains of old obſtructions: as, in this caſe, the *fœtus* muſt periſh through want of nouriſhment.

3° It is neceſſary, that the ſubſtance of the *uterus* be ſoft, and pulpous; in order that the protuberances of the *placenta* may inſert themſelves in them; and that the interior ſubſtance of the *uterus* may, in like manner, inſert itſelf into the ſinuoſities, which the protuberances of the *placenta* leave betwixt them; that is to ſay, in order that the adheſion of the *placenta* with the *uterus* may be firm and ſtrong. This adheſion, therefore, would be eaſy to be broken, when the *fœtus* ſhould become heavier; if the *uterus* were thin, and but little pulpous.

4° It is neceſſary, that the *uterus* have a certain degree of elaſticity, in order to embrace the *fœtus*; and keep it up, where nothing can confine it, and to hinder it from falling into the baſon, where it would be preſt and rubbed by the *oſſa innominata*. Abortions muſt be, therefore, frequent with women, who have the *uterus* lax, and without due elaſticity: which would ſuffer the *fœtus* to ſink low. The ſame thing happens, for the ſame reaſon, to women, who have the *uterus* naturally placed low. In general, the women, who bear their children low, are more ſubject to miſcarry than thoſe, who bear them higher.

5° Laſtly, it is neceſſary, that the orifice of the *uterus* be cloſe; without which, the milky lymph, that ought to nouriſh the fecundated *ovum*, in the two firſt months, is diſcharged, and wanted: and the *ovum* itſelf, which is not then very large, may eſcape, from the leaſt motion, or the ſmalleſt effort.

II. It may be eaſily judged, what harm the nouriſhment, furniſhed by the mother to the *fœtus* may do it. 1° If it be too abundant, which happens to women, who are naturally very ſanguine; who eat much; who uſe no exerciſe; or who neglect to be let blood, the *fœtus* will receive too much: and be ſuffocated by it.

2° If the mother, on the contrary, fall into a languiſhing diſeaſe, with obſtinate diſguſts, which hinder her from eating, the *fœtus* cannot receive ſufficient nouriſhment: and will die gradually of inanition: but this caſe is very rare.

3° If the blood of the mother be infected with any bad *leven*, as a venereal or ſcorbutic *virus*, the nouriſhment, which it will furniſh to the *fœtus*, will be the ſame: which may deſtroy the *fœtus* that is tender; though the mother, who is ſtronger, may reſiſt it. But this caſe does not always happen: as we ſee children born at the full time, and live, though infected with the venereal, or ſcorbutic *virus*.

4° Laſtly, If there be any carcinomatous ulcer in the *uterus*, the *pus*, which is diſcharged from it, will be imbibed by the plexus's of the veſſels of the *placenta*, ſpread on the *chorion*; and, paſſing thence into the *fœtus*, will kill it. But it is impoſſible, or at leaſt very rare, that a woman conceives, who has a cancerous ulcer in the *uterus*.

III. The health of the mother is neceſſary, to preſerve the health of the *fœtus*, which ſhe bears. Thus, if the mother be attacked by any violent diſeaſe, there is reaſon to fear, the *fœtus* will ſuffer greatly from it; and that it will die: which will occaſion a miſcarriage.

This often happens, when women, during the courſe of pregnancy, have a continued putrid fever; a malignant fever; the ſmall pox; a *diarrhœa*; a dyſentery; a *teneſmus*; an exceſſive * coſtiveneſs; a

* G. Fabricius Hildanus. *Obſervation. Centur.* VI. *Obſerv.* 62.

conſtant

conſtant vomiting; the epilepſy; a dropſy; a peripneumony; a pleuriſy, &c. But it happens more particularly in a *diarrhœa*, dyſentery, or *teneſmus*, where the efforts, that are made to go to ſtool, rub, and compreſs the *uterus*; and ſeparate the *fœtus*.

IV. Women are ſubject to violent paſſions; and ſuſceptible of all impreſſions in a ſtrong manner. In theſe circumſtances, there is made in them, convulſive contractions, or catchings in all the parts of the body: principally in the bowels; and particularly in the *uterus*; which compreſs, and detach the *placenta*; and precipitate the miſcarriage.

In this number, may be placed fits of anger; the effects of ſudden fear from ſome bad news; the exceſs of extreme joy, with immoderate laughter; and grief; when carried to a very great degree, which may produce the ſame effect: but do produce it more rarely. The greateſt part of authors put, among theſe cauſes, bad ſmells; which affect the noſe ſtrongly; and particularly that of an extinguiſhed candle *: but I by no means chuſe to vouch for theſe facts.

## *Of the cauſes, which ariſe from the* fœtus.

Theſe cauſes are not very numerous, and may be reduced to ſome particular accidents, that kill the child in the womb of the mother: which is followed by a miſcarriage.

Theſe accidents are, I. When the *fœtus* has a dropſy of the head or *abdomen*.

II. When the umbilical cord is ſo long, that, winding about the neck of the *fœtus*, in the motions which it makes, it intercepts the circulation of blood betwixt the mother and the *fœtus*. This caſe is pretended to be obſerved: but if it ever have been, it is at leaſt very rare.

* Plin. *Hiſtor. Natural. Lib.* VII. *Cap.* VII.

III. When, on the other hand, the umbilical cord is ſo ſhort*, that the *fœtus*, in moving, draws ſtrongly the *placenta*; and ſeparates it from the *uterus*. But I believe this caſe to be as rare as the preceding.

IV. When the *fœtus* falls into a *maraſmus*, and grows dry, from ſome cauſe difficult to be aſcertained; and at length dies. This caſe is very real, and happens pretty frequently: but it is ſeldom that any abortion is produced by it. Becauſe the *placenta*, which remains affixt to the *uterus*, is then converted into a mole: as we ſhall ſee below.

## *Of the cauſes, which ariſe from the* placenta.

Theſe are much leſs numerous than thoſe, which ariſe from the *fœtus*. I. The *placenta*, by its adheſion to the *uterus*, ſupports in its place the afterbirth, with the incloſed *fœtus*. It is neceſſary for this purpoſe, that it ſhould be large; in order, that it may be attached to the *uterus*, by a greater extent of ſurface, and more ſtrongly. If it happen, therefore, that the *placenta* be ſmall and narrow, from a fault of conformation, its adheſion with the *uterus*, which would be weak, might be overcome by a ſlight concuſſion; and occaſion abortion.

II. The *placenta* is deſigned, to receive the nutritious juices, which the *uterus* furniſhes; and to tranſmit them to the *fœtus*. It is requiſite, therefore, that it ſhould be porous, ſpungy, permeable. But it will not be ſo, if it be ſquirrous, or full of ſquirrous tumours. In ſuch caſe, the nouriſhment cannot reach the *fœtus*, or only in too ſmall a quantity: which, after having languiſhed ſome time, would die; which muſt occaſion abortion.

* G. Fabricius Hildanus, *Centur.* II. *Obſerv.* 5.

*Of*

*Of the exterior cauſes, which produce abortion.*

Among theſe, may be reckoned every thing, that may hurt, compreſs ſtrongly, rub, or ſhake violently the *uterus*. As falls, or blows on the belly, or any other kind of fall: every thing that draws cloſe or compreſſes the belly; and, among the reſt, the petticoat ſtrings being too ſtrait, or, the ſtays too hard: every thing that ſhakes the body, as immoderate dancing, running, efforts to lift, or carry a heavy body; repeated jumpings; travelling in a jolting carriage, or on horſeback; ſcreaming loudly; &c.

*Of the means, which ſome women wickedly employ to deſtroy their unborn offſpring.*

It is ſaid, there are many: but I have not been curious to know them: and I am not mortified at my ignorance in that point. Nevertheleſs, the occaſions, in which I have been employed for women, who have put them in practice, and who have been ſollicitous to eſcape the extreme danger, in which they found themſelves; have informed me of ſome: but I ſhall omit mentioning them. It is improper to teach what would be hurtful, if known. *Nefas docere, quod ſcire non eſt utile.* There will be found, for the inſtruction of young phyſicians, in the continuance of this chapter, the prognoſtic, that ſhould be made on theſe miſcarriages, almoſt alway fatal: and the means, which muſt be employed, in endeavouring to remedy them.

It may be ſeen, in the enumeration of the cauſes abortion which has been made, that there are ſome, which ſcarcely merit any conſideration; but as diſpoſitions to abortion: which muſt indeed be allowed. But theſe diſpoſitions, nevertheleſs, occaſion the

moſt ſlight cauſes, which ſupervene, to produce abortion where it would not happen otherwiſe.

It may be remarked, that I have explained theſe cauſes, as acting ſingly: which is the reaſon, why they do not always produce abortion: but it ſhould be underſtood, that if two or three of them combine, as there may be eaſily a concurrence of them, the abortion would, in that caſe, be moſt certain and inevitable.

## § III.

### SYMPTOMS.

The ſymptoms of abortion vary according to the ſtate of it; with reſpect to which, we may diſtinguiſh, the beginning; the progreſs; and the end: and, according to the quickneſs, with which it happens. For there are abortions, which are immediate, or at leaſt in a few hours: and others, which are a much longer time.

1° In the beginning of a miſcarriage, the women complain of a pain in their loins, hips, and at the *os ſacrum*. This pain comes from the divulſion of the *placenta* from the *uterus*; and they refer it to the external parts, which anſwer to the parts of the *uterus*: in which the ſeat of the pain is. When the ſeparation of the *placenta* is made quickly, and with violence, this pain is great. It is ſmall, and even ſometimes not perceived, when the ſeparation is performed ſlowly. It is greater in the miſcarriages of ſix or ſeven months: becauſe the *placenta* is bigger, and more ſtrongly conjoined.

2° Commonly the *placenta* ſeparates intire. All the after-birth, with the *fœtus*, falls then on the neck of the *uterus*; and, by the impreſſion, which it makes there, it excites contractions in the *uterus*, which cauſes ſhootings, that bear down into the *vagina*: and the orifice of the *uterus* opens; whence the blood and milk are diſcharged, which, after the ſeparation

paration of the *placenta*, have flowed into the *uterus* from the extremities of the cœcal veins, and lactiferous veſſels.

3° The preſence of the *fœtus* within the *uterus*, when it is confined, continues to cauſe the ſtrongeſt contractions of the *uterus*, which, by thruſting the *fœtus* lower, open the orifice more and more to the time of the fœtus's coming out: which is effected generally with more pain than in delivery, at the regular time: becauſe the neck of the *uterus* has not had time to be relaxed. In this paſſage, when there is great pain, come on tremblings of all the body, palpitations of the heart, and faintings; which ariſe from the ſympathetic motions cauſed by the pains.

4° When the *fœtus* is come out, the blood flows abundantly for ſeveral days: becauſe, in miſcarriages, the violent divulſion of the *placenta* often tears the cœcal veins, that were implanted in the *placenta:* in which caſe, there is not much difficulty in their cloſing again. This abundant flooding happens, particularly, in the miſcarriages, which are made with violence, and are in the laſt month of pregnancy.

5° When the abortion happens in the laſt months of pregnancy, the milk riſes to the breaſts, and occaſions the milk fever; for reaſons that will be ſeen in the following chapters: at leaſt, unleſs the greatneſs of the hæmorrhage prevent it.

6° It has been already obſerved, that the miſcarriages of the firſt and ſecond months are without pain: becauſe the *ovum*, or the germ, which is very ſmall, paſſes out without violence. Nor is there any blood loſt in ſuch miſcarriages: becauſe the *placenta* does not as yet adhere to the *uterus*; the veſſels of which are not, therefore, open.

7° There are abortions, in which, the *placenta* only ſeparates in one part: as a fourth, a third, or a half; while the reſt continue to be conjoined to

to the *uterus*. In this caſe, the miſcarrying woman has almoſt continual, though moderate, pains: but, what is very bad, ſhe has an almoſt conſtant flooding, which comes from the cœcal veins, that are ſeparated from the *placenta*. This flooding is greater or leſs, according to the extent of the place of the *uterus*, where the *placenta* is ſeparated. It is in vain to endeavour to ſtop this flooding. No ſucceſs can be had in it, ſo long as the child remains in the *uterus*; that it keeps dilated: which hinders the opened veſſels from cloſing. In this caſe the misfortune muſt be undergone, of ſeeing both the mother and child loſt, by the continuance of the flooding: at leaſt, unleſs ſome one have the courage to deliver the mother by force: which puts her in great immediate danger; but has, nevertheleſs, ſometimes ſucceeded. I ſhall not enter here into a more minute detail of this kind of abortion: becauſe the only remedy, that can be had for it, conſiſts in a manual operation, which belongs to the *Treatiſe on Deliveries*.

8° Laſtly, The laborious miſcarriages, particularly theſe, which have been purpoſely incited, often produce an inflammation of the *uterus*, by the lacerations they cauſe: and are often ſucceeded by a *fluor albus*, *ſchirrhus*, or ulcer in the *uterus*, for the ſame reaſon.

## § IV.

### DIAGNOSTIC.

There can be only two objects propoſed in the diagnoſtic of abortion. *The one*, to judge, if there be any ground of fear; and in ſuch caſe, to endeavour to prevent the dreaded conſequence: or if the conſequence have already taken place, to do all that remains; which is, to deliver the mother. *The other*, to diſtinguiſh the cauſes, which produce the abortion, in order to remove them, if there be a poſſibility:

poſſibility: or, at leaſt, to judge of the effect theſe cauſes may occaſion.

I. There is reaſon to fear abortion, if any cauſe capable of producing it have preceded: eſpecially, if this cauſe has been powerful and violent: if from that time, the motion of the child has been felt weaker, and leſs frequently: or if the breaſts, that were before full of milk go down, which proceeds from the *placenta*'s no longer adhering to the *uterus*, or only in a leſs degree; making the uterine milk flow more abundantly into the *uterus*, and diminiſhing the quantity of that, which ſhould paſs to the breaſts.

Abortion may be conſidered as ready to happen, or even as begun, if the ſides of the belly ſink; which proves, the *fœtus* is fallen into the baſon: if the mother feel pains, or ſhootings, in the *uterus*; particularly, if paſſing from the loins, they go downwards, and become frequent.

Laſtly, there can no longer be any doubt of the abortion, if the orifice of the *uterus* gape, and be open: particularly, if this dilatation continue to increaſe: if a milky lymph be diſcharged, which becomes afterwards bloody, and even pure blood: and if the pains, and ſhootings ſubſiſt ſtill; or even increaſe.

II. As to what regards the cauſes of abortion, it would be eaſy to diſtinguiſh what they are, which might occaſion it in each caſe, from the relation, which the patient might make of what has happened; provided the theory of miſcarriages be preſent in the memory. It may, by the ſame means, be judged, if theſe cauſes are capable of bringing on abortion: and if there be yet ſufficient time to remove them.

PROGNOSTIC.

## § V.

### PROGNOSTIC.

Abortion is always dangerous; and generally more ſo than natural delivery, for two reaſons. *The one*, that, in natural delivery, the *placenta* ſeparates of itſelf, without danger of any laceration, either in the cœcal veſſels, which are implanted in it; or in the internal ſurface of the *uterus*, to which it adheres. Whereas, in abortion, the *placenta* is ſeparated by violence; and almoſt always with *dilaceration*. *The other*, that, in the natural delivery, the orifice of the *uterus* is mollified before hand; as we ſhall ſee in the following chapter; and thence diſpoſed to dilate: which does not happen in abortion. To which, muſt be added, that, in the violent ſeparation of the *placenta* in abortion, it ſometimes is torn; and a part remains affixt to the *uterus*, which may have bad conſequences: and that alſo, in this caſe, the *placenta* is larger in proportion, than in the natural delivery: as has been remarked above; which renders the coming away of it more difficult.

II. Abortion is particularly dangerous in the four laſt months of pregnancy: as well, becauſe, then, the *placenta* adheres more ſtrongly to the *uterus*, and it is difficult for it to be ſeparated by force, without hurting the *uterus*, or the veinous *appendices*; as, becauſe the child is much larger. The danger of abortion is particularly very great at that time, when it moſt eaſily is produced by any violence; or by a blow, or fall; becauſe it is almoſt impoſſible, the *placenta*, ſo ſtrongly conjoined, can ſeparate itſelf readily from the *uterus*, and its veſſels, without dilaceration.

III. There may be placed in the number of very dangerous abortions, thoſe, which are excited in any manner

manner whatever it may be: becauſe the ſeparation of the *placenta*, that is produced, always leaves lacerations, which occaſion exceſſive floodings and inflammations almoſt always mortal: and which, when the patients have the good fortune to eſcape theſe dangers, cauſe, in the ſequel, ſchirrhuſſes, ulcers, abſceſſes, and cancers, in the *uterus*.

IV. The moſt dangerous abortions are thoſe, where the *placenta* ſeparates only at one end: remaining affixt to the *uterus* by the other. The reaſon of this may be ſeen at the end of § III. Thoſe, where the *fœtus* is dead, may be alſo reckoned in the number of dangerous abortions: becauſe it cannot aid, nor incite the *uterus* to contractions, in order to its expulſion. But theſe abortions muſt not be compared to thoſe, which we have juſt before ſpoken of. It is true, they are generally longer: but, as to themſelves, are leſs dangerous.

V. Beſides the dangers we have explained, there are others, which attend abortions, on account of their conſequences. They often bring on, 1° Inflammations of the *uterus*; either from the dilaceration, which the violent ſeparations of the *placenta* occaſions there; or, becauſe of the diſtenſions, which the *accoucheur* has made in the orifice, in order to dilate it. 2° An exceſſive flooding; which happens; becauſe the cœcal veins which have been torn or hurt, cannot cloſe themſelves as commonly. 3° An almoſt incurable barrenneſs: becauſe the excoriations, and cracks of the *uterus*, although cicatrized, afford a conſtant obſtacle to conception.

## § VI.

### *Method of cure.*

The treatment, that may be purſued in abortions, turns on the three following points.

I. To

I. To prevent abortion, if it be poſſible; and to attempt it in time.

II. To give, in caſe of abortions, when they cannot be prevented, all the aſſiſtance poſſible.

III. To remedy the accidents, which follow abortions, when they are dangerous: as they almoſt always are in thoſe occaſioned by any external cauſe: and, particularly, in thoſe, which are purpoſely incited.

I. In the firſt of theſe three points, two different caſes preſent themſelves. In *the firſt* caſe, it is proper to prevent abortion in a woman, who is not already with child, but who has been hurt in a preceding pregnancy: or who is of ſo delicate a conſtitution, that it is eaſy to foreſee there is danger of her miſcarrying. In order to this, the following remedies ſhould be uſed before ſhe become pregnant.

She muſt be forbid too frequent a commerce with her husband: ſhe muſt be preſcribed a regulated diet, ſweet, and mild: and ſhe muſt be adviſed to be moderate in her mirth and grief.

If ſhe be ſubject to any diſeaſe, which may have a bad effect on pregnancy, as floodings; irregularity of the *menſes*; or the *fluor albus*; it muſt be endeavoured to cure them, by employing the means propoſed before for theſe diſeaſes; *Book* I. *Chap.* IX and X.

If the woman have acrimonious humours; and there be reaſon to believe, that this acrimony will deprave the nouriſhment, that ſhould be furniſhed to the *fœtus*, and produce a miſcarriage; her blood ſhould be ſweetened, and corrected, by warm baths of ſweetening waters; by cooling apozems; or broths; filtred whey; aſſes milk; and cooling waters; as thoſe of Forges, which have great reputation.

If there be reaſon to ſuppoſe, that the *uterus*, being too ſoft and relaxed, cannot have a ſufficiently ſtrong

ſtrong adheſion to the *placenta*; which occaſions the *fœtus*, when it becomes large, to ſeparate; vulnerary broths with veal, and water creſſes, ſhould be given; to which, ſhould be added, ſome fingers full of ſenicle, and bugle; ſome glaſſes of a weak ptiſan of the woods, without any purgative: or, rather, the woman ſhould be carried, before ſhe is pregnant, to ſome hot baths; that ſhe may drink the water; foment her loins with them; bath in them; and receive the vapour of, or uſe injections with them.

If the woman be cacochymic, and full of humours; beſides the remedies propoſed, and which are proper for her; an iſſue ſhould be made in her arm, or leg. Zacutus Luſitanus *, praiſes this practice much; and pretends to have hindered miſcarriages by this means: and † Rivierus approves of it.

In ſhort, if, notwithſtanding all theſe precautions the woman becomes pregnant, without the appearance of danger of her miſcarrying, according to what has been explained, ſhe will then be in the ſecond caſe; of which we are going to ſpeak; and the remedies ſhould be employed for her, that are going to be propoſed.

The ſecond caſe reſpects miſcarriages, that are purely accidental, and cannot be foreſeen: and which come from ſome foreign cauſe; as a fall, ſtumbling, blow on the belly, fit of anger, or fright; or which have been criminally brought on. It is proper then, as ſoon as the accident happens, to make the pregnant woman be put to bed: to take eight or nine ounces of blood from her; repeating it, the ſame, or the next day, if the pains continue: to give her two mollifying clyſters, with the decoction of linſeed, and oil of ſweet almonds; or with equal parts

* Medicor. princip. Hiſtor. *Lib.* II. *Obſerv.* 159.
*Lib.* I. *Hiſtor.* XX. *Obſerv.* 19. † Praxeos Medicæ. *Lib.* XV. *Item.* Praxeos Admirand. *Cap.* XVII.

of

of cows milk, and decoction of marſh-mallows: and to allow her only broth for two days; or, at moſt, ſome light ſpoon meat; or ſome rice milk, or boiled eggs.

Theſe are efficacious remedies, which ſucceed often, when the *placenta* has not yet begun to be ſeparated; for, when it is ſo, however little it may be, there is nothing to be hoped for. It would be well, nevertheleſs, to add, to the precautions which have been enumerated, aſtringent remedies, that may be conſidered as proper to reſtore the adheſion of the *placenta*; whether they be employed internally, or externally. Theſe are the internal medicines moſt recommended.

| | | |
|---|---|---|
| Animal. | raſped ivory;<br>ſpodium;<br>*burnt harts-horn;<br>*prepared coral;<br>*kermes, or ſcarlet grains; | In powder; in the doſe of from fifteen to twenty grains. |
| Roots of | *tormentil;<br>*dropwort;<br>*biſtort;<br>St John's wort; | In powder, from 10 to 12 of each, to 20.<br>In decoction, from half a dram, to a dram. |

Woods; the ſanders, in powder, from fifteen to twenty grains; in decoction, one dram.

Seeds of plantain, in powder, twenty grains; in decoction, one dram.

| | | |
|---|---|---|
| Leaves of | *yarrow,<br>*ſhepherds purſe,<br>*bugle,<br>*ſpeedwell, | In infuſion, as tea, from two fingers full to ſix. |

*Maſtich; *Myrrh; In powder, from five grains to twelve.

Juices,

| | | |
|---|---|---|
| Juices, or Gums. | **terra japonica*, ; **hypociſtis* ; dragons blood ; | From twenty grains, to half a dram. |

Conſerve of red roſes, in ſubſtance, one dram.

| | | |
|---|---|---|
| Diſtilled waters of | *plantain ; *ſhepherd's purſe ; knot graſs ; *yarrow ; | which may be employed, to make potions, or juleps. |

| | | |
|---|---|---|
| Syrups of | *dried roſes ; plantain ; *yarrow ; magiſtral aſtringent ; | which may be uſed in juleps, or potions, in the doſe of an ounce of each. |

With theſe drugs may be made ptiſans, potions, juleps, powders, boluſſes, or troches; according to the rules of art: obſerving to chuſe the moſt efficacious amongſt them; or, at leaſt, thoſe moſt in uſe; which are above marked with an aſteriſk *; and not to employ more for each compoſition than three or four: to augment, or diminiſh, the doſe of each, according to the number of the whole, that may be employed: and to add a proper doſe of ſome narcotic, to calm the pains: which will contribute moſt to prevent the miſcarriage, while there is any room to do it.

As to the external remedies, they may be reduced, 1° To embrocations, with the *theriaca*, or the *confectio alkermes*, diſſolved in red wine: with which mixture, the *abdomen* ſhould be rubbed; and afterwards covered with a flannel; or a compreſs in two doubles, dipt in the ſame embrocation.

2° To aſtringent fomentations, with the decoction of red roſes, plantain, ſhepherd's purſe, knot graſs, tormentil, balauſtins, pomgranate bark, leaves of oak galls, &c.

3° To aſtringent plaſters, which are to be applied on the loins: and ſometimes on the hypogaſtric region. Among the plaſters of this quality, thoſe moſt recommended are,

The counteſs's plaſter:
The plaſter *contra rupturam:*
Madam Fouquet's plaſter; which is found among her ſecrets.

I believe, it would be proper to add ſome remedies boaſted of by the antient phyſicians, too much prejudiced by the opinions of their times; of which ſome have no virtue; and others very little; but are ſuch, nevertheleſs, as may be employed by thoſe, who chuſe it: and others are abſolutely ſuperſtitious; and ought to be deſpiſed. I apprehend it neceſſary to inform young phyſicians of them; in order that they may diſconcert the ignorant, who make a ſecret of them: and who avail themſelves of them, to impoſe them on women, who are naturally credulous.

There may be put, into the number of theſe remedies, 1° Four or five germs of freſh eggs, in a ſpoonful of Spaniſh wine, or broth. This medicine is a ſudorific: but not at all aſtringent.

2° Red, or, to ſpeak more properly, crimſon ſilk, cut very ſmall; and ſwallowed in the yolk of an egg. The virtue of this medicine, if it have any, comes from this; that the red ſilk was dyed with the ſcarlet grain, or kermes: which is, indeed, recommended for miſcarriages. At the preſent time, when this colour is dyed with *cochenille*, it ceaſes to have that quality. But were the ſilk ſtill dyed with kermes, it would be better to take the grain in ſubſtance, than the ſilk, which has been dyed with it; and which can only acquire very little of its virtue.

3° The

3° The powder of *veronica*, in the doſe of half a dram, in one or two cups full of ſome aſtringent infuſion. The *veronica* is, indeed, recommended for the preventing miſcarriages: but it is very far from meriting the firſt rank.

As to the ſuperſtitious remedies, I boldly place in that number, 1° The eagle ſtone, or *lapis aetites*; which, as they ſay, being affixed to the arm, or hung round the neck, keeps the child in the womb of its mother; though, on the contrary, they ſay alſo, it facilitates delivery, and even produces abortion, if it be fixed to the thigh.

2° The loadſtone applied to the navel; which, by attracting the child, as it attracts iron, hinders it from deſcending.

3° The ſame virtues attributed to emeralds, jaſpers, diamonds, and the bone of the heart of a ſtag, with juſt as little reaſon.

4° Zacutus * Luſitanus even dared to affirm, that miſcarriages may be prevented, by putting round the belly of a woman, when there is danger of one, a girdle of the ſkin of a ſea-horſe, or when that cannot be had, of the ſkin of a wolf: but this is not extraordinary from that author, in whoſe work, many of the like obſervations may be found.

II. Notwithſtanding all the precautions, that are taken, and remedies employed, it often happens, that abortion cannot be prevented; which is an inevitable misfortune, whenever the *placenta* is ſeparated at any one corner; for there is no room to hope, that it can reunite itſelf again. This makes the *ſecond* object of treatment of miſcarriages. Under theſe circumſtances, when it is perceived, that the pains continue, and bear downwards; that the orifice of the *uterus* dilates; and that the diſcharge of blood

* Praxeos Admirandæ, *Lib.* II. *Obſerv.* 161.

augments; it becomes neceſſary to determine, to accelerate an abortion, that cannot then be avoided.

In order to this, the *vagina*, and more particularly the orifice of the *uterus*, ſhould be anointed with freſh butter: the patient ſhould be exhorted to encourage the efforts, and make them force downwards; the dilatation of the orifice of the *uterus* ſhould be gradually aſſiſted; and, in ſhort, every thing, that art can dictate, on ſuch an occaſion, ſhould be employed. But the detail of this belongs to the treatiſe on deliveries, to which we ſhall refer it.

All that a phyſician ought to do in ſuch caſe, is to make the patient take ſome cup-fulls of broth, if the labour laſt long: and, if there be reaſon to fear ſhe may faint, to order ſome gentle cordial: as Alicant wine; *theriaca*; *confectio hyacinthi*, or *confectio alkermes*, in wine, or broth; or a ſpoonful of *eau des carmes*, or double diſtilled balm water, pure, or weakened with a little water, according to the urgency of the caſe: laſtly, if the delivery be laborious, to take away ſome blood; and, if the child, when born, ſhew ſigns of life, to cauſe it to be baptized immediately, conformably to the orders of the church.

III. The delivery being performed, the whole attention muſt be turned to the accidents, which accompany, or follow it. If there happen to be a great flooding; which is very common; the patient ſhould be bled in the arm, if her pulſe admit of it: and the moſt efficacious remedies for ſtopping or moderating the flooding ſhould be afterwards given her: on which head, *Book* I. *Chap.* IX. may be conſulted: where the exceſſive *menſes*, and the remedies proper in ſuch caſes, are ſpoken of.

I knew a ſurgeon, who, in ſimilar circumſtances, made a bold attempt, but with ſucceſs. He went into the country, to deliver a woman, who had great

great reaſons for keeping her condition a ſecret. The delivery was followed by a terrible hæmorrhage; and the ſurgeon, unprovided with any remedy in ſo urgent a caſe, determined to inject vinegar into the *uterus*. The bleeding ſtopt immediately: the *uterus* was no way injured; and the *accoucheur*, as well as the delivered woman, got happily out of the dilemma.

If, the day after the delivery, the pains of the *uterus*, and the inflammation, give room to apprehend an inflammation of the *uterus*, the meaſures ſhould be taken, which have been before adviſed for an inflammation of the *uterus*, in *Book* II. *Chapter* I.

If, after the firſt danger be over, the delivered woman find herſelf afflicted with an obſtinate *fluor albus*; or there be any reaſon to fear an ulcer; the remedies that are proper in theſe ſeveral diſorders, which may be found above, in *Book* I. *Chap.* X; or *Book* II. *Chap.* IV, V, and VII; in which the detail is ſpoken of; ſhould be employed without delay.

## CHAP. XIII.

### *Of the natural delivery.*

IF we have, in the preceding chapters, admired more than once the providence and wiſdom of God, in the admirable order, and mechaniſm of conception, and the geſtation of the child in the womb of the mother, there is not leſs ſubject to admire him here, for the bounty with which he employs theſe ſeveral means to facilitate the coming out of the child in delivery; that ſeems

to be naturally impoſſible. Galen *, in treating of this ſubject, conſidering the obſtacles, which are naturally oppoſed to the paſſing out of the child, confeſſes, that he cannot avoid admiring the manner, in which they are ſurmounted in delivery: but he cannot flatter himſelf, with being able to comprehend it: from whence he, though a Pagan, takes occaſion to acknowledge the goodneſs of the Being, which has formed us with ſo much art; and to exalt his wiſdom and power.

In order to explain, with order, the manner, in which delivery is performed; and to endeavour to remove the difficulties attending it; it is proper to divide this chapter into three articles. In the *firſt*, are to be enumerated the cauſes, which determine delivery to happen at a time regulated by nature: in the *ſecond*, are diſplayed the cauſes, which produce delivery, in conſequence of the action of the cauſes which determine the time: and, in the *third*, is explained, what the phyſician ought to do during the delivery, in order to facilitate it; and what he ought to order the delivered woman after the labour.

## *Of the cauſes, which determine delivery to be at the time regulated by nature.*

I. As admitting it to be certain, there is a time fixt for delivery, as has been proved, in the tenth chapter; which time falls in the tenth month; when the child is ſufficiently formed, and ſtrong, to ſuffer ſafely the effect of the air on its body, and its

* *Quòd os matricis eo uſque aperiatur, ut poſſit fœtibus facilem præbere exitum, nemo ignorat; ſed quod pacto id accidat, mirari poſſumus, intelligere non poſſumus. At natura tùm hæc tum alia omnia in partu animalis admiranda, machinatur commenta .... In mente nobis inàe nenire debet, quæ bona is artifex qui nos conformavit, nobis ſit largitus, tùm agnoſcere clarè debemus non ejus modò ſapientiam, verùm etiam potentiam.* Galenus, *de uſu partium, Lib.* XV. *Cap.* VII.

lungs;

lungs; and, when its ſtomach is in a ſtate to digeſt the milk, it muſt ſuck; it is evident that ſomething new muſt then happen to the *fœtus*; which excites it to make efforts to come out of its priſon, in which it is ſhut up; and paſs into a new kind of life, become proper, and, as it were, neceſſary to it. This is the preciſe cauſe, that is ſought for; and which determines it to the time regulated by nature.

All the world agrees as to the neceſſity of this cauſe: but they do not equally agree what it is.

1° According to ſome, it is the magnitude the *fœtus* has gained, in the tenth month, which occaſions, that finding itſelf uneaſily confined in the *uterus*, which cannot diſtend in proportion, it moves more than ordinarily; and produces delivery.

2° According to others, it is the weight of the *fœtus*, which, in the tenth month, forcing its covering downwards, ſeparates, or moves gradually the *placenta*; ſo much more eaſily, in proportion, as, towards the end of pregnancy, the extenſion of the *uterus* effaces gradually the little eminences of its interior ſurface, where it is united with the *placenta*.

3° Others believe, that the cauſe, which determines the delivery, is the quantity of *meconium*, that is to ſay, of that kind of pitchy ſubſtance, or blackiſh matter, which is collected in the inteſtines of the *fœtus*; and cauſes there, as they conceived, ſhooting pains, which agitate it in a lively manner.

4° There are others, who are perſuaded, that it is the quantity of urine collected in the bladder of the human *fœtus*, for want of the membrane *allantois* to receive it; which, by its irritation on the bladder, and the motions of the *fœtus* which it excites, determines the delivery.

5° Laſtly, others, and the greateſt number, admit all thoſe cauſes together, in order not to miſtake in the matter; and attribute the delivery to theſe four cauſes combined; that is, to the magni-

tude and weight of the *fœtus*; and to the collection of the *meconium*, and the urine in its body.

But these opinions, though they have hitherto divided all the suffrages of physicians, do not appear to me capable of determining delivery at the stated time, which I believe may be proved from each in particular, in very few words.

1° Two twins are together bigger in the eighth month, than one *fœtus* is in the tenth. Nevertheless, these two twins do not produce delivery in the eighth month; but remain quietly in the womb of their mother, till the tenth. It cannot be, therefore, believed, that one child alone can determine delivery by its magnitude.

2° The same holds good of the weight of the *fœtus*. Two twins weigh more in the eighth month, than one alone in the tenth. But twins do not produce delivery by their weight, in the eighth month; neither, therefore, can one *fœtus* alone cause it in the tenth.

3° If those who believe, that the quantity, or the fermentation of the *meconium*, is the cause which determines the delivery, had observed the small proportion of it, that children void, when they are born; or which is found in their bowels, when they die in the birth; and had seen the consistence of this *meconium*, which excludes all suspicion of fermentation; it is clear, they would not have embraced an opinion so ill founded.

4° Lastly, It is, with less reason still, the quantity of urine found collected in the bladder of the *fœtus*, should be considered as the determining cause of delivery; because the urine is not collected there. Fœtuses piss in the wombs of their mother: and their urine mixes with the water of the *amnion*; which gives the urinous and muriatic flavour this fluid is found to have, at the end of pregnancy. The small quantity of urine, likewise, which children make, proves greatly, that it never could incommode,

commode, or excite them to motions capable of determining the time of delivery.

Inſtead of ſuch conjectures, which are frivolous, why has not mention been made of a very certain, and very real motion, which happens to every *fœtus*, in the tenth month, ſome time before delivery? That is, the change of ſituation of the *fœtus*, or its turning or *culbute*. We have ſeen above, in the ſeventh chapter of this book, that, during the courſe of pregnancy, the *fœtus*, which ſwims in the water of the *amnion*, has its head high; its face towards the belly of its mother; and moreover, is rolled up like a ball: its head upon its knees: the heels againſt the buttocks; and the arms extended againſt the ſides. But this poſition is abſolutely changed in the tenth month, at the approach of delivery. The head falls below in the neck of the *uterus*; and the legs and feet mount upwards againſt the *fundus*. In this poſition, the *fœtus* has its face turned againſt the back of its mother; and, as it finds then, that it has a little more room, it takes advantage thence, to extend and ſtretch out its legs againſt the *fundus* of the *uterus*.

Some women, who have been ſeveral times before delivered, perceive this motion at the time when it is made: but all perceive it, when it has been made. Their belly then falls, and ſinks: the ſides of it grow flatter: the women feel the child very low; as if it were going to fall: and they cannot walk with the ſame facility, as before.

This motion of the child is purely mechanical; and is cauſed ſolely by the weight of the head, and upper parts. It has been ſeen, in the place we have above quoted, that, during the courſe of pregnancy, the head and breaſt of the *fœtus*, that are above the navel, by which it is ſuſpended, were lighter than the belly, and the other parts, which are below the navel: from whence we have concluded, with reaſon, that, according to the laws of hydroſtatics, the

*fœtus*

*fœtus* muſt keep itſelf in the middle of the waters of the *amnion*, with its head raiſed upwards.

It muſt, therefore, from the oppoſite reaſon, let fall its head downwards; and make the *culbute:* if it happen, that, in the tenth month, the head and the breaſt are become heavier in proportion than the parts, which are below the navel. And this does happen in reality. The medullary ſubſtance of the brain grows, and augments, during the pregnancy, more than the other parts: becauſe it is ſofter, and more eaſily gives way. It becomes, at the ſame time, more firm and compact. In the breaſts, likewiſe, the lungs, which are deſigned, a ſhort time after, to ſupport the action of the air that is to enter them, have grown much; and acquired a greater degree of firm conſiſtence. By theſe means, the weight of the parts above the cord augments daily; and, this progreſs ſtill going on by inſenſible degrees, theſe parts become at length, in the tenth month, heavier in proportion than the reſt of the body: and this is what produces the *culbute*.

There is nothing here ſuppoſed, but what is confirmed by experience. All children are born with a large head: much larger in proportion to their bodies, than it is in adults. If they be laid upon the hand by the middle of the back*, it will be perceived, that the upper parts will preponderate: and I am convinced, proofs ſtill more certain would reſult, if this experiment were made in a more exact manner.

We cannot, in this point, too much admire the wiſdom of the Author of nature; and his attention, to procure every thing, which could ſerve to facilitate delivery. It is neceſſary the *fœtus* ſhould, for its convenience, have its head higheſt during preg-

* Graviſſimæ enim ei (*fœtui*) ſunt ſuperiores partes ex umbilico libratæ. *Hip. de Naturâ Pueri.*

nancy:

nancy: at which time, the head is accordingly lighteſt, to procure it this advantage. It is neceſſary, in order to the delivery, that it ſhould preſent itſelf by the head to the orifice of the *uterus:* at which time, the head being become the heavier, makes the *culbute* to put it in this poſition. It is neceſſary, that its face be turned on the ſide of the *os ſacrum*, in order to hinder the noſe from being cruſhed againſt the *os pubis*; and that it ſhould not be choaked by the irruption of the waters of the *amnion*; and even of blood, that flows from the *uterus* when the *placenta* is ſeparated, and which might run into the mouth. The *culbute*, by making the head fall below forwards, makes the child turn, at the ſame time, its face from before to behind. It is neceſſary, that the *fœtus* ſhould fix its feet againſt ſome point of ſupport, to be able, by ſtretching itſelf, to dilate the neck of the *uterus*, in its new ſituation. Accordingly being leſs confined, it is at liberty to extend itſelf, and to fix its feet againſt the *fundus* of the *uterus*. Laſtly, it is neceſſary, that all this ſhould happen in the tenth month: and it does conſequently happen then, that the upper part of the *fœtus* has acquired gradually the requiſite weight to produce theſe changes, a little ſooner in ſome than others, according to the ſtrength, vigour, and health of the *fœtus*; and the manner, in which it has been nouriſhed: from whence come the variations in the time of delivery.

The *fœtus* remains quietly in this ſituation: its head, by puſhing downwards, cauſes a ſenſe of weight; but not very ſenſible: its feet, by elongating, and its arms by diſtending, ſtrike againſt the *uterus*; and cauſe a perception of pain: which is the forerunner of labour that is then near at hand, and is ſlight in the beginning. The women that have already had children know them, under the name of *falſe pains*, or *mouches*. They are more or leſs ſtrong; and more or leſs frequent; according

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as the *fœtus* is more or leſs vigorous; as the *uterus* is more or leſs ſenſible; and as the delivery is more or leſs nigh.

Notwithſtanding the repoſe of the *fœtus*, its ſituation on the neck of the *uterus* does not avail it now; its head, which weighs on the neck, compreſſes the veins and lymphatic veſſels, that go back from the orifice of the *uterus*; *vagina*; *vulva*; and even cartilage, which unites the two *oſſa pubis*; retards the return of the blood and lymph: and gives riſe to an effuſion of a part of the *ſerum* of the blood; and even of ſome part of the lymph; which cauſes, in all theſe parts, an œdematous ſwelling, that moſt women are perceived to have before delivery.

This lymphatic ſubſtance, thus imbibed into the ſubſtance of the parts, through which the child muſt paſs, relaxes, ſoftens, and diſpoſes them to ſtretch, and diſtend without pain, or danger of being torn: which contributes much to facilitate delivery. For this reaſon it is obſerved, that women, in whom there is a proper interval betwixt the *culbute*, and the coming away of the child, are delivered, other things being equal, more happily, and readily, in general, than thoſe, in whom the delivery follows too nearly the *culbute*.

By the help of the emollient effect, on the neck, and neighbouring parts, the *fœtus*, which always puſhes forwards, though weakly, arrives at the interior ſurface of the orifice of the *uterus*: at which time, every thing is ſet in action, to promote the delivery: and all the cauſes, which muſt then be in force, combine as in concert. But to render comprehenſible, how this is brought about, it is proper to go deeper into the matter.

There is, in the body, ſeveral mechanical motions, which are made in one part, on account of, and dependent on, impreſſions made on another part; often pretty diſtant. Theſe motions can be only

only performed by the intermediation of nerves, which go from the part where the impreſſion is made, to the brain: and, from thoſe which go from the brain, to the parts, where theſe motions are. Theſe motions are called ſympathetic, and are executed by known laws: but it would be too prolix, to enter on an explanation of them here. It is thus, that ſome grains of tobacco, drawn into the noſe, irritate the pituitary membrane of it; cauſe firſt a great contraction of the muſcles of inſpiration; and, afterwards, of a ſudden, bring on a quick contraction of the reſpiratory muſcles; and, conſequently, a briſk expiration, that, impelling the air with impetuoſity, makes it paſs through the noſe, where it produces a kind of exploſion, known by the name of ſneezing.

It is very plauſible, and perhaps evident, that it is by a ſympathetic motion, nearly of this kind, that delivery is performed. The parts are well known, that are contracted for this purpoſe. Therefore the only queſtion is to know the parts of the *uterus*, on which the impreſſion is made, which puts it in action: that is to ſay, in order to employ the moſt proper and expreſſive term, what is the part, which is the *ſenſorium*.

But this *ſenſorium* cannot be in the interior ſurface of the cavity of the *uterus*. The *fœtus* inhabits there for nine months, and produces different impreſſions by its motions. It makes the *culbute*, which ought to put the whole in action. Nevertheleſs, all this does not excite delivery. The women are not incited to go into labour; and delivery does not begin to be performed, till the head of the child be arrived at the interior edge of the orifice of the *uterus*: and that it makes a particular kind of impreſſion, either by its weight, or its friction. It is, therefore, in this place of the *uterus*, the *ſenſorium* is to be placed, which produces delivery.

It is not a matter of wonder, to see the *sensorium* of a sympathetic motion placed in a small part of a much larger cavity. We see it the same, in all other parts, where sympathetic motions are found. The excrements excite dejection, only when they come to the extremity of the *rectum*, at the edge of the *sphincter:* because the *sensorium* is there. The urine does not excite *miction*, till it acts in the neck of the bladder near the *sphincter*. In sneezing, even snuff never excites it, when it acts only on the nostrils; there is a necessity it reach the pituitary membrane. It is natural, therefore, to place the *sensorium* in the *uterus*, where the impressions are made, which occasion delivery, and in the interior edge of its orifice: since labour never begins till the *fœtus* arrives at that place, and makes the requisite impressions there. By admitting this supposition, every thing relative to delivery is easily explained: as we shall see in the following article.

I believe I could corroborate what I have said, by the instance of what happens in women brought to bed, when it is necessary to discharge the clots of blood, the first or second day after the delivery. In the situation, in which those women are kept in bed, laid flat on their backs, the blood of the *lochia*, which stagnates in the *uterus*, must form there clots, sometimes pretty large. So long as these clots remain in the *uterus*, they are not perceived: but as soon as they are pushed towards the orifice, if it be already closed, which often happens, they cause almost the same contractions, and efforts, as are felt in the coming out of the child: which as we see, can only come from the impression, they make on the parts, that we consider as the *sensorium*.

## § II. *Of the causes which produce delivery.*

It has been seen, that as soon as the *fœtus* comes to the interior edge of the *uterus*, every thing is set

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in action for delivery: becauſe the impreſſions, which the *fœtus* makes on this part, put in action, according to the known laws of ſympathetic motions, all the muſcular fibres of the *uterus*; eſpecially the circular fibres of its *fundus*, which Ruyſch has taken for a particular muſcle: the *fundus* of the *uterus* coming then near to the neck; and the ſides going cloſer; the *fœtus* is ſtrongly puſhed downwards. As to itſelf, the *fœtus*, thus preſt, kicks; and fixing its feet againſt the *fundus* of the *uterus*, it ſtretches itſelf, and extends, according to the degree of force, that it has: which favours the effect, that the contraction of the *uterus* muſt produce. The kickings of the *fœtus*, by ſtriking againſt the interior ſurface of the *uterus*, cauſe ſhootings, more or leſs lively, and long, according to the ſtrength of the *fœtus:* but does not much advance pregnancy. The contractions of the *uterus*, which is much more efficacious, are known under the name of efforts, or throws.

Theſe two cauſes, acting in concert, force the orifice of the *uterus*, which is ſo much the more eaſily performed: as the tonic contraction of the radious fibres, which ſurround it, excited by the ſame impreſſion, as the child makes on the *uterus*, effectually contribute to dilate it.

When this orifice begins to open, there flows out a certain quantity of a milky lymphous *ſerum*. This fluid was contained between the *uterus* and the *chorion*; and are the remains of the milky *ſerum*, which was ſeparated in the *uterus*; and abſorbed by the *chorion*, for the nouriſhment of the *fœtus*. But as ſoon as the head of the *fœtus* begins to get into the orifice; that is to ſay, ſpeaking in the ſtyle of midwives, as ſoon as the head *crowns*, and ſtops up this orifice; nothing more can go out. It is only a quantity of the water of the *amnion*, which has then eſcaped: and which, being contained in the membra es,

branes, form as it were a bag, and a long body in the *vagina*.

This bag remains in that ſtate till the head be in the paſſage, up to the ears; but then, either it is torn of itſelf; which generally happens: or it is neceſſary, the midwife ſhould tear it: becauſe it retards the coming out of the child. The waters, which come out thus, carry the name of the *firſt waters*. When this is over, the delivery advances with ſpeed: and the *fœtus* has a free iſſue to come out. Its head, of which the volume is the largeſt, has paſt; its body is ſpread over with a mucilaginous humour; and it can ſlip eaſily through its own coverings, lubricated in the ſame manner; and which have ſtopt in the paſſage. Laſtly, the waters, which remained ſtill in the coverings, behind the body of the *fœtus*; and are called the *ſecond waters*, eſcaping gradually at different times, as ſoon as the parts of the *fœtus* ceaſe to cloſe up the orifice, contribute, by moiſtening it, to make the reſt of the body of the *fœtus* ſlip forwards. Thus every thing aſſiſts to accelerate delivery; and it is happily accompliſhed.

It appears, by what has been ſaid, that the child comes into the world intirely naked; and that it leaves all its coverings behind it it the *uterus*, which is indeed the moſt common caſe. But it ſometimes happens, that the child, in coming forwards ſtrongly, inſtead of tearing the part of the coverings, which form the bag, draws them intirely out; and comes into the world, with the head covered with it. This is what is called, being born with a *caul*; in Latin, *naſci galeatum*. It is pretended, that this is a preſage of good fortune: and I have ſeen credulous women carefully keep the *caul* of their children. It is a folly which may be more eaſily excuſed in weak women, than in thoſe lawyers, who bought them at a great price, formerly, in the perſuaſion,

ſuaſion, they ſhould draw conſiderable advantages from them, as Lampridius ſays *.

It ſometimes happens, that the *fœtus* is wholly covered with the after-birth, which remains intire. It may be conceived, how great the alarm of a family would be, who ſhould imagine it a monſter, and who would not be freed from their fright, till the midwife herſelf ſhould convince them of their miſtake, by cutting open the membranes; and taking out a well formed child.

Such is the manner, in which ſimple deliveries are performed. But when they are longer, more difficult, and more laborious, more powerful ſuccours are neceſſary: and nature procures them accordingly. As, at that time the head of the child makes longer, ſtronger, and more painful impreſſions on the orifice of the *uterus*; which is reluctant to open; the ſympathetic refluxes, become ſtronger, muſt act upon a greater number of parts; that is to ſay, on the muſcles of the *abdomen*, and diaphragm; and put them into contraction; as in fact they are put: which gives a great increaſe of force to the contraction of the *uterus*, and effectually contributes to ſurmount the obſtacles that attend delivery.

This might be eaſily verified by the ſucceſs, which emetics, clyſters, and ſternutatories have in difficult labours. Theſe remedies can promote the coming away of the child, only as they put into contraction, the muſcles of the *abdomen* and diaphragm; excite vomiting; occaſion ſtraining; or make the woman ſneeze.

From what has been ſaid on the cauſes of delivery, it may be concluded,

1° That, other things being alike, the moſt eaſy delivery muſt be that, which is made while both

* Ælius Lampridius *in Antonio Diadumeno.*

the mother and child are alive; or becauſe both of them operate to the common purpoſe.

2° That delivery is more difficult, when the child is dead; but that it may be performed, nevertheleſs: becauſe the contractions of the *uterus*, aided by thoſe of the diaphragm, and *abdomen*, ſuffice to bring forth the child without its contributing to the effect, by its own action.

3° That it is almoſt incomprehenſible, that delivery can be made when the mother is dead, whatever vigour may be ſuppoſed to be in the child: and, therefore, the recited obſervations of ſuch facts are to be ſuſpected.

4° Laſtly, that it is abſolutely impoſſible delivery can be performed, when both mother and child are really dead: and the obſervations, that relate it, muſt be deemed falſe.

I do not believe this article ſhould be concluded, without making a ſhort recapitulation of the means, which the wiſdom, and bounty, of the Supreme Being have employed, in favour of women, to facilitate the delivery of their children. We have ſeen, in the preceding article, thoſe ſubſervient to the preparation for the labour. Therefore, the queſtion is confined here to thoſe, which relate to the delivery itſelf.

The firſt advantage ariſes from the coverings of the *fœtus*, the *amnion* and the *chorion*, paſſing, at the ſame time, along with it, into the orifice of the *uterus*; ſtopping there; and, by this means, lining it, if I may uſe the expreſſion; and defending it from the rubbing of the *fœtus*, and the fingers of the midwife.

The ſecond advantage is, that the mucilaginous humour ſpread over the coverings, as well as the ſurface of the body of the *fœtus*, ſerves to lubricate it; and to facilitate its paſſing out.

As a third advantage, may be eſteemed, the coming out of the ſecond waters, which eſcape gradually

gradually during delivery; and which, by their ſaponaceous quality, moiſten, relax, mollify, and anoint, as well the paſſage, as the body of the *fœtus*, which promotes its paſſing out ſooner.

The fourth advantage is, the ſoftneſs of the body of the child. The ſutures of the *cranium* are only tendinous; and the head is formed of ſeveral moveable bones: the articulations of the limbs are only cartilaginous; and give way eaſily to extraordinary flexures; by which means, the head elongates itſelf; grows round; and models itſelf to the opening of the paſſage: the ſhoulders, and the breaſt contract: and the hips themſelves yield in ſome degree: in ſhort, all the body of the child grows ſmaller; and, by that means, comes out much more eaſily.

To theſe advantages, which take their riſe on the ſide of the *fœtus*, muſt be joined two, which come on the ſide of the mother: and which are certainly of ſome utility in difficult labours, eſpecially in young women.

The one is, the flexibility of the *coccyx* that bends inward: which augments, in the ſame degree, the diſtance betwixt the bones of the baſon, through which the child muſt paſs. Older women are deprived of this advantage: becauſe the articulations of the bones of the *coccyx* are become too cloſe; and the bones themſelves leſs flexible. It is, therefore, one of the cauſes that women, who have no children till late in life, riſque more in child-bed than thoſe who are younger.

The other is, the ſeparation of the bones of the *pubes*, which enlarges the interval of the ſpace of the *oſſa innominata*. In proportion to this diſtance, it not only follows, that the ligament, which joins the bones of the *pubes*, is extremely mollified, and capable of extending; but, alſo, that the cartilages, which unite the bones of the *ilia* with the *os ſacrum*, are alſo ſoftened, ſo as to ſtretch a little. I ſay a little; becauſe it is certain, that the diſtance

of a line on the ſide of the bones of the *ilion* is ſufficient to procure it one of near an inch between the bones of the *pubes*. A doubt has a long time ſubſiſted, with regard to this diſtance: and the point is yet controverted. But there are, on this head, ſuch poſitive obſervations *, that their veracity cannot well be queſtioned. It is true, this ſeparation is but rarely found; and only in young perſons, in whom the cartilages are more eaſily extended: and they do not happen, but in long, difficult, and laborious deliveries.

## § III. *Of the manner, in which women ſhould be treated during labour.*

Phyſicians are ſeldom called to labours, and when they are, there are few matters that come within their cognizance. They muſt leave to the midwife, or the *accoucheur*, all that regards the manual operation of delivery; the extraction of the *fœtus*, and the method of managing, as well the delivered woman, as the new-born child. For this reaſon, I ſhall refer theſe matters over to the *Treatiſe on the Art of Midwifery*; and ſhall confine myſelf here, to ſome reflections on certain things of which phyſicians ought to be informed. They regard the three periods of delivery; when the labour commences; when it is at the height; and when it is ended.

I. At the beginning of the delivery, a clyſter muſt be given to the woman, to empty the bowels; and ſhe muſt make water, to empty the bladder,

* We ſhall content ourſelves with quoting Ambroſe Paré *Liv. de la Generation, Chap.* XIII.

William Harvey. *De Generat. Animal. Exercitat.* 57.

Spigelius. *Lib.* II. *De Corporis Humani Fabricâ, Cap.* XXIV.

Johannes Riolanus. *Anthropograph. Lib.* V. *Cap.* XIII.

Iſbrandus Diemerbroeck. *Anatom. Lib.* IX. *Cap.* XXVI.

Johannes-BaptiſtaMorgagni, *Adverſ.* III. *Animadverſ.* XV. who have each ſeen the diſlocation of the *os pubis*, in ſeveral laborious deliveries.

in

in order that nothing may impede the coming out of the child. If the perſon be young, plethoric, and have not been bled, or but little during pregnancy, ſhe may be bled in the arm eight ounces; though it is but ſeldom, that this is neceſſary.

II. In the labour, the woman ſhould be encouraged. If ſhe be a young perſon, without experience, ſhe ſhould be ſpoken to in a compaſſionate manner; but courageouſly nevertheleſs; and without any appearance of concern. If the delivery be protracted, and the woman have faſted a long time, ſhe ſhould have ſome little cups of broth given her. If ſhe be weak, ſhe may be made to take ſome ſpoonfuls of Alicant wine; or a little *confectio hyacinthi*.

If the labour have been long; the pains have been acute; and the pulſe riſe; it is proper to bleed in the arm: but this ſeldom happens, unleſs in laborious deliveries; which are not in queſtion here; but belong to the *Treatiſe on the Art of Midwifery*.

It generally happens that the contraction of the *uterus*, particularly of its *fundus*, and the kicking of the child, ſeparate the *placenta*; and then, the after-birth ſoon follows the child without trouble. But if, the child being come away, the *placenta* remain yet adhering to the *uterus*, then, in order to be more at liberty, the child muſt be diſpoſed of; and the cord muſt be tied, on the ſide of the child, and on that of the *placenta*, at two or three inches diſtance from one ligature to the other. The cord muſt be cut betwixt them; and, after having given the child to the nurſe, who muſt hold it to the fire, the extraction of the *placenta* muſt be attempted: on which head, I refer to the *Treatiſe on the Art of Midwifery*.

III. The delivery being performed, what remains to be done is the proper buſineſs of the midwife, or *accoucheur*. The delivered woman muſt be waſhed, and put into a bed ready prepared for her.

Her belly muſt be ſlightly bound with a napkin, in four doubles, in order to wait to bind it more cloſely, when the *uterus* has emptied itſelf. The *uterus* muſt be covered ſimply with a piece of ſoft linen in four doubles, to hinder the cold air from entering into it: and the woman muſt be ſollicited to make water, as ſoon as the parts, which have ſuffered in the labour, ſhall be properly diſpoſed to it.

If the *vulva* and *vagina* be very painful, a cataplaſm of crumb of bread may be applied to them: but generally nothing of this kind is neceſſary.

IV. It often happens, that the delivered woman feels acute pains in her belly. The place, where they are perceived, ſhews, they have their ſeat in the *uterus*: which diſtinguiſhes them from ſhooting pains in the bowels. They are of two kinds. The one comes from the traction, that the *uterus*, in contracting, makes on the parts which have ſuffered: and this ſeldom happens, but in laborious deliveries. The other, and which is the moſt common, is cauſed by the clots, or grumes of blood, that preſenting themſelves to the orifice of the *uterus*, in order to paſs out, excite, by the irritation, which they make there, the ſame contractive efforts, as are found in delivery. The ſituation of the delivered woman, who is laid horizontally on her back, by retaining the blood in the *uterus*, occaſions the formation of theſe clots. For which reaſon, it is right to place her in bed, in ſuch manner, that the loins may be higher than the buttocks. But the abundance of blood, eſpecially if it be thick, and the too quick tendency to cloſe the orifice of the *uterus*, contribute ſtill to it. Sometimes, even all the diſorder comes from the neglect of keeping the *vulva* ſtopped up: which ſuffers the cold air to gain entrance into the cavity of the *uterus*; and this, at the ſame time it facilitates the form-

forming of the grumes of blood, by rarifying putrifies the *uterus*.

For remedying the ſhooting pains of the firſt kind, the patient ſhould be made to take two ounces of oil of ſweet almonds, drawn without heat; beat up with an ounce of ſyrup of lemons: or, if it be preferred, with an ounce of Alicant wine. Clyſters ſhould be given, with the decoction of mother-wort, or mug-wort; to which is added, freſh butter, or oil of ſweet almonds. Embrocations ſhould be made on the belly, with oil of camomile; and a compreſs of four doubles ſhould be kept applied to it.

In the ſecond caſe, beſides the remedies we have propoſed, it is proper, that the nurſe, in waſhing the delivered woman, which ought to be done at the beginning, twice a day, endeavour to draw out the grumes, which are in the paſſage. It is proper to oblige the delivered woman to put herſelf on her ſeat, over a flat baſon, in her bed; or even over a chair with an open bottom, in order to promote, in this ſituation, the coming away of the grumes. Laſtly, if the diſorder continue, recourſe ſhould be had to warm injections of barly water, and a little honey of roſes, in the *uterus*: which will remove the cauſe of the diſorder.

# CHAP. XIV.

## *Of the* lochia.

WE have ſeen above, that as ſoon as the *placenta* adheres to the interior ſurface of the *uterus*, the veinous *appendices* of the uterine veins are ſwoln, and ſtretch; project within the *uterus*; are buried in the cellulous ſubſtance of the *placenta*; and, opening there, diſcharge blood during the pregnancy; which ſerve for the nouriſhment of the *fœtus*. We have ſeen, likewiſe, that the vermicular, or lactiferous veſſels are tumified in that part where they adhere to the *placenta*; and emit milk there during the pregnancy, which ſerves, in the ſame manner, to nouriſh the *fœtus*. It reſults from thence, that when, in the delivery, the *placenta* is ſeparated from the *uterus*, the veinous *appendices* muſt diſcharge the blood into the *uterus* itſelf; which, before, they diſcharged into the *placenta*; and that the mouths of the vermicular veſſels muſt diſcharge there the milk alſo, which was before poured into the *placenta*.

Theſe are the ſources of the diſcharge of blood, which ſucceeds delivery. This diſcharge was known, by the Greeks, under the name of Λοχεια, *lochia*; from the verb Λοχευω, *parturio*; becauſe it happens after delivery. The Latins have called it *purgamenta uteri*; and the French *vuidanges:* becauſe the *uterus* cleanſes and empties itſelf by it. There is nothing to be diſtinguiſhed in it but blood, although there be milk and lymph; as has been ſaid; but the abundance, and colour of the blood prevents theſe humours from being ſeen: and they begin only, to be diſtinguiſhed, when the blood ceaſes to flow: as happens always before the diſcharge of the other humours ſtops; which occaſions

ſions the *lochia* being diſtinguiſhed into *red lochia*, as long as the blood flows; and *white lochia*, when the blood having ceaſed to flow, nothing is diſcharged but milky lymph. It is of the firſt, we are to be underſtood to ſpeak, in this chapter: becauſe it is they only, that merit attention. The other are ſcarcely to be regarded as more than the *fluor albus*, and it is in that view they are to be treated.

The red *lochia*, however, may appear in three different ſtates. Sometimes they are moderate; ſometimes exceſſive; and ſometimes ſuppreſt: as this conſtitutes three different ſtates, we will treat of them in three different articles.

## § I. *Of the moderate* lochia.

The *lochia*, in order to merit the denomination of *moderate*, muſt be ſo in their duration, as well as their diſcharge. But it is too difficult, to fix the juſt bounds they ſhould keep with regard to theſe points; on account not only of the variations, which happen in different, but even in the ſame woman, in different deliveries, according to the age; conſtitution; manner of living; bleedings, which have preceded; and diſeaſes which have been undergone, &c.

I. In general, the *lochia* are moderate, when they laſt from four days to ſix: which does not, nevertheleſs, conclude, that they may not laſt ſometimes a longer ſpace; and ſometimes a ſhorter; without affording reaſon for their being deemed exceſſive, or ſuppreſt.

It is yet more difficult, to fix the quantity of the diſcharge in the moderate *lochia*. They would appear to be very great, if we were to judge of them by the great guſhings, when the *fœtus* is coming out. But that diſcharge is not pure blood; but the remains of the waters of the delivery: which, coming out immediately after the child, is tinged with

with a ſmall proportion of blood. The true *lochia* are much leſs copious. It is not the arteries which furniſh them; but the veins, from whence the blood always runs more ſtrongly. Theſe veins do not convey it directly into the *uterus*, but it is turned by derivation, through the veinous *appendices*; which empty it into the trunk of the veins. The blood muſt there flow moderately in the common ſtate of the *lochia:* which occaſions, that the quantity, loſt in a child-bed, may be eſteemed equivalent to that, which the ſame woman is accuſtomed to loſe, in three or four returns of the *menſes*. But this computation is not on ſo ſteady a principle, but that the *lochia* may be ſometimes a little more copious, and other times a little leſs, without ceaſing to be moderate.

The true way of judging, when the *lochia* ought to be conſidered as moderate; is, to conſult the effects, which the delivered woman perceives from them. If ſhe has neither oppreſſion, head-ach, tenſion, nor pain in the *uterus*, the *lochia* are moderate; although not copious. They ſhould, in like manner, be regarded as moderate, although much more abundant, if the delivered woman do not fail in her ſpirits, and ſtrength.

II. As to the cauſes of the variations, which are found in the moderate *lochia*, it is eaſy to deduce them from the theory, we have explained. Thus, for example, the *lochia* will be more or leſs abundant,

1° Accordingly as the delivered woman ſhall be more or leſs plethoric; that ſhe ſhall have eaten more or leſs during pregnancy; and that ſhe ſhall have been let blood more or leſs.

2° Accordingly as ſhe ſhall have the blood more or leſs fluid, or more or leſs thick, either from her conſtitution, or from the regimen ſhe may have obſerved.

3° Accord-

3° Accordingly as ſhe may have her blood more or leſs agitated by fever, acute pains, or uneaſineſs.

4° Accordingly as ſhe may have the veinous *appendices* of the *uterus*, whence the blood flows, more or leſs numerous; or more or leſs large; in conſequence of their original conformation.

The ſame holds good of the duration of the *lochia*, which flow for a more or leſs long time,

1° Accordingly as the delivered woman abounds more or leſs in blood: which occaſions her to furniſh them a greater or leſs ſpace of time.

2° Accordingly as the *uterus* cloſes more or leſs quickly, by its elaſticity; which it begins to do immediately after delivery: and accordingly as it cloſes more or leſs quickly the veinous *appendices*, whence the *lochia* flow.

3° Accordingly as the veinous *appendices*, beſides the effect of the compreſſion, which the *uterus* makes on them in cloſing itſelf, ſhut of themſelves more or leſs quickly by the degree of elaſticity, which they have.

III. It follows from hence, that the *lochia* from the moment that they begin, muſt be diminiſhing till ſuch time as they ceaſe intirely: which muſt be from three cauſes.

1° Becauſe the blood which furniſhes them, muſt be diminiſhed in proportion as they are furniſhed.

2° Becauſe the *uterus*, which regains its former ſtate, cloſes the veinous *appendices* in cloſing itſelf; and leſſens their cavity.

3° Becauſe the veinous *appendices* do not recover their proper elaſticity till ſuch time as, by their ſhutting up, they are intirely cloſed.

It is hence, that the red *lochia* ceaſe generally before the ſixth day of the lying-in. At which time the milky *lochia* are diſtinguiſhed: which do not ceaſe ſo ſoon. For, although the mouths of the lactiferous veſſels, from whence they flow, are expoſed, as well as the veinous *appendices*, to the contractile

tractile action of the *uterus*, they have not, from the want of elasticity, the same advantages as the veinous *appendices*, to be able to contract, and close themselves; insomuch, that they gape a long time: which makes the milky *lochia* flow longer than the red; and degenerate sometimes, into an obstinate *fluor albus*.

IV. As the *lochia*, so long as they are moderate, cause neither disorder or inconvenience, they may be considered, as a natural evacuation, which does not require any remedy. Thus all the attention is confined to the nourishing moderately the delivered woman, with food, that is wholesome, and easy to be digested; to influence her to keep in bed, that she may not run the hazard of increasing the *lochia*, particularly when they are abundant: to giving her every other day, or, at least, every third day, a clyster with the decoction of camomile, mother-wort, and mug-wort; to which should be added, oil of sweet almonds: to making her wash twice a day, with a slight decoction of chervil: and to avoiding every thing, that may give her concern, or cause any fainting.

## § II. *Of the excessive* lochia.

I. DESCRIPTION. It might seem, that, in the number of excessive *lochia*, should be put, those, which are too copious, without being too long; those which are too long, without being too copious; and those which are, at the same time, both too abundant, and too long: but this is a mistake. The abundant *lochia*, of a short duration, are only so for the first days; do not considerably weaken the lying-in woman; and should be put in the class of moderate *lochia:* except only those which exceed the common proportion. As to the *lochia*, that last a long time; but are sparing in quantity; they give less trouble; and merit still less, the appellation of excessive

exceſſive *lochia*. This name is only proper for the *lochia* that are abundant; and which laſt alſo a long time. It is, likewiſe neceſſary, that they ſhould be followed with menacing accidents; as falling away, weakneſs, faintings, and convulſions: for it is thence we can judge moſt certainly of it.

II. CAUSES. The cauſes, which have been enumerated in the preceding article, are capable of giving riſe to *lochia* more abundant than ordinary, though of the claſs of moderate *lochia*; as a *plethora*; too great fluidity of the blood; its acrimony; too great number, or too great opening, of the veinous *appendices*; are not ſufficient to cauſe the *lochia*, that are truly exceſſive, though they may ſometimes contribute to it. It is requiſite, in order for that effect, there ſhould be cauſes more powerful, and efficacious, as thoſe of which we have ſpoken.

1° The laceration of a greater or leſs number of veinous *appendices:* which happens often in laborious deliveries, where it is neceſſary to ſeparate the *placenta*; and in abortions at the end of pregnancies, particularly when they are brought on by any violent cauſe.

2° Dilacerations of the ſurface of the *uterus*, more or leſs extenſive: which happen often in the ſame caſes; and not only to many veinous *appendices*; but even to the veſſels of the *uterus* itſelf; as well arteries, as veins.

3° *Gercæ*, or choppings in the ſubſtance of the *uterus*, more or leſs deep; or ſcratches with the nail; imprudently given in difficult labours. Theſe *gercæ* produce the ſame effects, as the lacerations of the *uterus*.

4° To theſe cauſes, muſt be added a fourth, not ſo bad, but common enough. It is the fluttering of the coats of the *uterus* by ſudden jerks: which, by beating the blood, makes it flow out more abundantly. This fluttering is the conſequence of ſhooting pains: which ſubſiſt in the *uterus*; of irritations

tations caused by the *placenta* remaining wholly, or in part in the *uterus*; or grumes of blood, which float in its cavity; or of the irritation, which acrimonious blood makes, in flowing over the parts of the *uterus* that are torn, or cut.

III. SYMPTOMS. It is very easy to deduce, from this theory, the symptoms, which attend, or follow the excessive *lochia*.

1° In these *lochia*, the *uterus* is torn, cut, wounded, or, at least, exposed to causes, which irritate it; as shooting pains; and the *placenta*, or grumes of blood retained. There must, consequently, be pain in the *uterus*, greater or less, according to the circumstances.

2° The pain, with which the *uterus* is afflicted, must, according to the known laws of sympathy, make all the fibres rigid, in a greater or less degree, according to the proportion of pain. There must be, therefore, in the *uterus*, a tension equivalent to the pain.

3° The flooding is great, in excessive *lochia*; and it goes on increasing. The mass of blood must, therefore, be diminished; and, consequently, the quantity of animal spirits, which is always, other things being equal, in proportion to the quantity of blood, that furnishes them. Thus these spirits, being separated in less quantity in the brain, flow more weakly, and sparingly into the parts: which produces a general failure of the strength, weakness of the pulsation of the heart, lowness of the pulse, dimness of the sight, fainting, &c.

4° If the pain of the *uterus* augment ever so little, the irritation, which it makes, will cause a sympathetic reflux of the animal spirits into different parts of the body; and, consequently, convulsions, or convulsive motions in those parts.

5° Lastly, if the cuts, or lacerations of the *uterus* inflame; as must often happen; and these inflammations

mations extend; they bring on fever; which increaſes, and ſupports the flooding.

IV. DIAGNOSTIC. The exceſſive *lochia* are evidently diſtinguiſhable: becauſe the greatneſs of the flooding; and the nature of the ſymptoms, which characteriſe the diſorder; are known.

With reſpect to the cauſe, it is always ſome laceration, or cut in the *uterus*, more or leſs great. Thoſe exceſſive *lochia* only muſt be excepted, which come from the *placenta*'s being retained in the *uterus*; or from grumes of blood, which float there. But the midwife, who has delivered the patient, and who can examine her by the touch, can, and ought, to inform the phyſician of theſe particulars.

V. PROGNOSTIC. All hæmorrhages, which come from any interior part, are bad and dangerous: and the diſcharges of blood that come from the *uterus*, after a labour, in which it has been much hurt; and which are cauſed, or kept up by lacerations of its interior ſurface; are much more ſo.

1° It is to be apprehended, that theſe cuts may inflame, and come to ſuppuration: and if that happens, they may form, in the *uterus*, an ulcer very bad, and difficult to be cured; eſpecially if it become carcinomatous.

2° If there be ſo much ſucceſs, as to heal ſuch an ulcer; which does not admit of being deterged; the *cicatrix* runs the hazard of being either callous, or fungous. In the firſt caſe, it would give riſe to a *ſchirrhus* in the *uterus*: of which, the conſequences may be very bad. In the ſecond, it may grow large; and form, in the *uterus*, a *ſarcoma*, or falſe *ſchirrhus*; of which we have ſpoken above, *Book* II. *Chap.* VI.

3° Beſides theſe dangers, which are remote, there is another in the exceſſive *lochia*, which is very preſſing, when the flooding is very great, and laſts a conſiderable time; eſpecially when it cauſes extreme

treme weakneſs; frequent faintings; and, what is worſe, convulſions, or convulſive motions.

4° Laſtly, the exceſſive *lochia* are very difficult to be cured, whenever they depend on lacerations, or cuts of the *uterus:* whither it is difficult to convey proper remedies.

VI. METHOD OF CURE. When it is known, that the *lochia* are exceſſive, it is proper to endeavour to diminiſh the too great abundance of them, by proper remedies, without attempting to ſtop them all of a ſudden; which might have bad conſequences.

In this view, it is right to bleed once or twice in the arm, eight or nine ounces each time. If the patient have no fever, ſhe ſhould be fed with incraſſating diet, as rice, gruel, *ſemoule*, or panada; all prepared with weak broth, or ſome yolks of eggs. But, if there be any fever, ſhe ſhould have nothing but chicken, or veal broth, with ſome hinder parts of frogs; or even broth of fiſh, if there be an opportunity. The decoction of the root of the great comfrey ſhould be given, as the common drink.

But if it be known, that there be cuts, or *gercæ* in the *uterus*, inflamed; or ready to inflame; if there be tenſion, or pain in the *uterus*; or it be frequently agitated with dull tremblings, or violent ſhocks; in ſuch caſes, without altering any thing of the conduct, which has been propoſed, the bleeding of the arm ſhould be repeated, accordingly as the ſtrength of the patient may allow.

Aſtringent remedies, at the ſame time, ſhould be given: as a bolus with *terra japonica*, dragon's blood, maſtich, and red coral, prepared each in the proportion of ten or twelve grains for a doſe; the whole incorporated with an aſtringent ſyrup; as ſyrup of dry roſes, plantain, or myrtle berries: and this bolus ſhould be repeated morning and evening.

But

But if the flooding be very abundant, it is better to have recourſe immediately to more efficacious remedies: ſuch as the two following.

The firſt is, a bolus, compoſed of roots of tormentil, and dropwort, powdered, in the quantity each of fifteen grains for a doſe; and made into a bolus, with the ſyrup of comfrey. This bolus ſhould be given from four hours to four hours.

The ſecond is, a ptiſan, made with a quart, or two pounds weight, of decoction of the root of comfrey; to which, ſhould be added, drop by drop, fifty-five or fifty-ſix drops, of the white water of *Rabel ad gratam aciditatem:* and, to render it agreeable, it ſhould be diluted with an ounce, or two, of ſyrup of capillair: which compoſition makes it a kind of lemonade. The patient ſhould take, every two hours, in the intervals of the broths, a cup of ſix ounces of this mixture a little acidulated; continuing it, ſo long as the flooding remains, but diminiſhing the doſes, or enlarging the diſtance of them, as it decreaſes.

It is material to join, to theſe remedies, a moderate uſe of narcotics, to alleviate the pains of the *uterus*, and quiet the agitations it ſuffers: which contribute to keep up, and even to increaſe the flooding. It is not proper to order theſe narcotics in a doſe, that will ſtupify the patient; but in moderate doſes, that may compoſe her, and even make her ſleep; but ſlightly. The doſe of narcotic, that is given every day, may be mixt with aſtringent remedies; contriving that the ſtrongeſt may be taken every afternoon, in order to procure more quiet nights; or rather the narcotics may be given ſeparately, if it be choſen: one third of the doſe in the morning; and the other two thirds in the evening.

In caſes of exigence, injections may be made into the *uterus*, of the warm juice of plantain leaves;

to which, may be added, ſome drops of Rabel's water.

If it be known, that the diſorder be kept up by the retention of the *placenta* in the *uterus*; or by grumes of blood; which cannot paſs out, it is proper to endeavour, in the beginning, to take them away; and it may generally be done, as to the *placenta*. With relation to the grumes, if the patient cannot void them, by placing herſelf on the cloſe-ſtool, where it can be done, it ſhould be tried to diſſolve them by injections, with barley water, to which ſhould be added a little oxymel.

Though much cannot be expected from external applications, it is not proper to refuſe women the ſatisfaction of putting, on their loins, linen dipt in oxycrate; and of applying, on their bellies, aſtringent plaſters, or fomentations of the ſame nature.

Exceſſive *lochia*, although cured, leave often ulcers in the *uterus*; more or leſs conſiderable, but always difficult to be cured. *Book* II. *Chap.* IV. of *ulcers of the uterus*, may be conſulted: as may alſo, on the method of cure of the exceſſive *lochia*, be ſeen, in *Book* I. *Chap.* IX. what is ſaid of the treatment, that ſhould be purſued in the exceſſive *menſes*.

Fumigations are not proper in the exceſſive *lochia:* becauſe, by heating the *uterus*, they increaſe the flooding: at leaſt, except they be aſtringent: and then they would be dangerous. I believe, nevertheleſs, it is right to mention a fumigation, which, a German phyſician boaſts as a ſpecific in the exceſſive *lochia*. It appears to me, that it may be employed without danger: but I am afraid it would be without ſucceſs. This * fumigation is the following: ℞ *Segetis ſecalinæ recentis, ſummit. arboris Betulæ*, āā m. iij. *Pulveriſentur groſſo modo pro ſuf-*

* M. N. C. *Decad.* III. *Ann.* VII, and VIII. *Obſerv.* 182. *pag.* 301.

*fumigio*

*fumigio ter iterando. Admiratione profectò dignum eſt*, adds this phyſician, *tale remedium, dictum ſacrum, profuiſſe conſtanti cum eventu.*

## § III. *Of the ſuppreſt* lochia.

I. DESCRIPTION. If the *lochia* be ſometimes exceſſive, as we have ſeen, they are ſometimes, alſo, ſuppreſt: which is the directly contrary ſtate. The ſuppreſſion may be perfect, and abſolute; which is the moſt dangerous: or *imperfect*, which is not ſo much a ſuppreſſion, as a ſimple diminution, more or leſs conſiderable. Either may happen in the firſt days of child-bed; that is to ſay, the ſecond, or the third day of delivery; in which caſe the danger is great, and the accidents bad: or, in more advanced time of child-bed; that is to ſay, towards the ſeventh, or eighth day of the delivery; and then the danger, and accidents, are leſs conſiderable.

The ſymptoms, which attend them, are not the ſame in all ſubjects: but, in the number of common ſymptoms, may be accounted tenſion, ſwelling, and pain of the *uterus*; pain in the loins, bottom of the back, and groins; nauſea, and vomitings; ſhivering; fever; inflammation of the *uterus*; and even ſometimes *delirium*, the *coma vigile*, or the *coma ſomnolentum*.

II. CAUSES. The two kinds of ſuppreſſion of the *lochia* come from the ſame cauſes: all the difference, which there is in them, conſiſts in this, that they are more powerful, and act more ſtrongly, when they produce an abſolute and perfect ſuppreſſion; and leſs ſo, when they cauſe an imperfect ſuppreſſion, or a ſimple diminution.

The firſt of theſe cauſes is, the patient's catching cold. Whether it be by the cold air's getting into the *uterus*, through the neglect of the nurſe, in not keeping the *vulva* covered; or through the patient's being expoſed to cold at her feet, from the

chamber's not being ſufficiently warm; or from the imprudence of ſuffering her to drink too cold liquor of any kind. The effect of cold, that is any way produced in the lying-in woman, cauſes a ſudden contraction in the *uterus*; which ſtops the *lochia*. There is no room to be ſurpriſed, that theſe cauſes have ſuch an effect on child-bed women: ſince they have the ſame conſtantly in women, who enjoy the beſt health, when they are expoſed to them in the time of the *menſes*.

The ſecond cauſe is, ſome trouble, grief, fear, or fainting; which, as one may ſay, takes the lying-in woman unawares. The paſſions of the mind, eſpecially when they are ſudden, produce a conſtricture of the *uterus*, that wholly ſuppreſſes the diſcharge. It is known, that the ſame cauſes act, in like manner, in women, who have their *menſes*, and ſtop them.

The third cauſe is, a violent *diarrhœa*, which comes on the lying-in woman; and is the conſequence of indigeſtion, from having eat too much. The great evacuation, that is made by ſtool, neceſſarily diminiſhes, that which ſhould be made by the *uterus*. Thus, whereas the two preceding cauſes may, and do often, produce a true and abſolute ſuppreſſion of the *lochia*; this only occaſions a ſimple diminution, which is not in itſelf quite ſo dangerous; becauſe the evacuation remedies the *plethora* from whence the danger may accrue; if, as experience evinces, a *diarrhœa* were not always hazardous in a child-bed woman.

Laſtly, the fourth cauſe is, the inflammation of the *uterus*; which, by tumifying the ſubſtance, muſt cloſe up all the veinous *appendices* from whence the blood of the *lochia* flows. This inflammation is always the conſequence of hurts, diſtenſions, cuts, or *gercæ*; which the interior part of the *uterus* has received, in a laborious delivery, from the hand of an unſkilful midwife. It will be readily comprehend-

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ed, that this laſt cauſe muſt produce a ſuppreſſion of the moſt dangerous kind: and experience too fatally confirms it.

III. SYMPTOMS. The explanation of the ſymptoms, which attend or follow the ſuppreſſion of the *lochia*, are ſo clear, that there is no need of dwelling long on them.

1° The blood, which is diſcharged from the *uterus* is, all of a ſudden, ſtopt in the ſuppreſſion of the *lochia*. It muſt, conſequently, fill, and ſwell the veſſels of the *uterus*; and thence, come the tenſion and ſwelling of this part; and the pain, which the patient feels.

2° Although the ſeat of this pain be in the *uterus*; when the patient feels it, ſhe will, nevertheleſs, aſcribe it to the neighbouring parts; as often happens in all internal diſorders: and, from thence, it comes, that if the *uterus* ſuffer in its *fundus*, or poſterior part, the delivered woman complains of pain in the ſmall of the back; or end of it: and that ſhe complains of the groins, or *pubes*, if it be in the neck of the *uterus*.

3° In the ſuppreſſion of the *lochia*, the blood, which flows from the *uterus*, is always ſtopt ſuddenly. It muſt, therefore, regurgitate, by degrees, into the veſſels of almoſt all the body.

At firſt into thoſe of the ventricle: which, being ſwelled, diſtends the coats of this part: and by augmenting the ſenſibility of them, which gives riſe to ſickneſs at the ſtomach; and to vomitings ſometimes even of blood.

Into thoſe of the lungs: that will be ſurcharged with them: which cauſes a difficulty of breathing: and a ſpitting of blood.

Into thoſe even of the brain, that will be overloaded with it: which will produce the *coma ſomnolentum*; and *coma vigile*; *delirium*; and bleeding at the noſe.

4° The painful overfulneſs of the *uterus* will often excite all the accidents of the hyſteric paſſion: as has been explained above; *Book* II. *Chap.* XI: whence this often happens in the mere ſuppreſſion of the *menſes*.

5° If the diſorder depend on the inflammation of the *uterus*; or if it bring it on; as often happens; the patient will have the greateſt part of the ſymptoms, which attend internal inflammations; as ſhiverings; fever; burning heat in the *uterus*; increaſe of ſwelling, tenſion, and pain.

IV. DIAGNOSTIC. It turns on three points, to know the diſorder, the kind of it, and the cauſe of it.

The diſorder is known, by the relation of the woman herſelf, or the nurſe; and what is yet more certain, by the inſpection of the cloths.

The kind of this diſorder is known; that is, whether the ſuppreſſion be perfect, or imperfect; by the ſame inſpection of the cloths. If they be taken away as clean as they are put on, the ſuppreſſion is perfect: on the contrary, it is imperfect, if they be tinged with blood: and the degree of the ſuppreſſion may be judged of, accordingly as they are more or leſs ſo.

It requires a little more attention, to diſtinguiſh on what cauſe, the diſorder depends. It muſt be attributed to one or other of the two cauſes we have mentioned, if it be known through the information of the nurſe, or any other attendants, that the patient has caught cold; or that ſhe has been affected by any fright, or anger, or grief; eſpecially, if there be no fever, nor looſeneſs; and the ſymptoms be ſlight.

If the patient be taken with a violent *diarrhœa*, there is no occaſion to look farther for any cauſe of the diminution, which may happen to the diſcharge of the *lochia*.

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Laſtly, if the ſuppreſſion be attended with fever, and the patient complain much of tenſion, ſwelling, heat, and pain of the *uterus*; it cannot be doubted, but that there is in ſome part of the *uterus* a greater or leſs inflammation, eſpecially if the diſeaſe ſucceed a long and difficult labour, where it is very probable the *uterus* may have been hurt.

V. PROGNOSTIC. A bad prognoſtic ſhould be always made of the ſuppreſſion, or diminution of the *lochia* in child-bed women; ſince the ſimple ſuppreſſion of the *menſes* is regarded, with reaſon, as a dangerous diſorder in women, who are otherwiſe in good health. It may, moreover, be eaſily comprehended, that a total ſuppreſſion is much worſe than only a diminution.

Other things being equal, the ſuppreſſion, and diminution of the *lochia*, are ſo much more dangerous, as they happen ſooner after the labour; at which time, this evacuation is more abundant, and more neceſſary.

The ſuppreſſion and diminution of the *lochia*, which come from the two firſt cauſes, are leſs dangerous; becauſe they do not preſume any conſiderable fault in the *uterus*. The ſimple diminution of the *lochia*, which happens in conſequence of a great looſeneſs, is generally very fatal: becauſe the looſeneſs is very difficult to be ſtopt in child-bed women; and ſoon exhauſts them. Laſtly, the ſuppreſſion, the moſt dangerous, is, that which is cauſed by the inflammation of the *uterus:* becauſe, beſides the bad ſymptoms it brings on, it is to be dreaded, that the inflammation may turn to a gangrene, or come to ſuppuration.

From whatever cauſe the ſuppreſſion of the *lochia* proceeds, it almoſt always leaves in the *uterus* ſtrangulations, or obſtructions, which diſorder the regular courſe of the *menſes* in the women who eſcape, and which there is great trouble to overcome.

Laſtly, it is advantageous, in the ſuppreſt *lochia*, when there happens any great evacuation, which, without exhauſting the patient, diminiſhes the *plethora:* as the bleeding at the noſe, or piles; or a copious diſcharge of urine, or ſweat.

VI. METHOD OF CURE. To eſtabliſh order in the detail of the method of cure, it is proper, to diſtinguiſh the cauſes of the diſeaſe: becauſe they demand different treatments.

1° If ſuppreſſion come from either of the two cauſes, it is proper at firſt to employ bleeding, to prevent the *plethora*; to relax, and give liberty to the *uterus*, and to endeavour to re eſtabliſh the courſe of the *lochia.* It has been a long time diſputed, whether the bleeding ſhould be in the arm or the foot; but the queſtion appears now to be decided. If the *lochia* be not intirely ſuppreſſed; the bleeding ſhould be in the foot; becauſe it is hoped, by deriving the blood from the *uterus*, to force the obſtacles, and recover the *lochia.* But if the *lochia* be totally ſuppreſſed, it is not proper to bring the blood to the *uterus*, from whence there is no diſcharge: and it is, therefore, proper then to bleed in the arm. The number of bleedings cannot be determined; but if the diſorder be urgent, and the ſtrength of the patient permit, it is expedient there ſhould be four, in the two firſt days.

It muſt be endeavoured, in the mean time, to relax the *uterus*, by ſoftening, emollient, and ſlightly purgative remedies. There ſhould be given to the patient, every morning, an *apozem*, or ſome broth of chicken or veal, with wild ſuccory, borage, pimpernel, or maiden hair; in which, ſhould be diſſolved, a dram of *ſal de duobus.* A clyſter, or two, ſhould, be every day, given with emollient decoction; and an ounce of lenitive electuary. She ſhould be made to drink largely of a ptiſan of capillair; and to take ſeveral cups of a ſlight decoction of tea, or veronica.

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She ſhould have emollient fomentations of the *uterus*; and this ſhould be by fomentations, and embrocations, with oil of lilly; or oil of ſweet almonds; rubbing them gently round the *uterus*, to endeavour, by that friction, to overcome its conſtriction. In this caſe, even fumigations may be uſed; with the ſimple decoction of emollient herbs of the fomentations: of which the vapour muſt be received by a funnel. It ſhould be obſerved to join to theſe remedies, every day, a proper doſe of ſome narcotic: of which a third ſhould be given in the morning; and the other two thirds in the evening. Nothing is more efficacious than narcotics; for relaxing the *uterus*, when an *erethiſmus* is the cauſe of the diſorder. Laſtly, though the patient may be without fever, the moſt certain way is to keep her to broth, until ſuch time, as the *lochia* be duly reſtored. The giving them a ſtronger diet would be a means of augmenting the *plethora*.

2° If the patient has a *diarrhœa*, and there be reaſon to attribute the diminution of the *lochia* to this diſeaſe, all endeavours muſt be applied to the ſtopping it; or at leaſt to moderate the evacuation.

The patient muſt be obliged to hold in her body, a half clyſter, made with tripe broth, and the yolk of an egg: and ſhe muſt receive a freſh one, as ſoon as the other is voided. There muſt be given her, in the day time, a little ſpoonful of a potion; made with *terra japonica*, dragon's blood, calcined harts horn, and red coral prepared, in the doſe of fifteen or twenty grains each, diluted with four ounces of plantain water, and an ounce of orange-flower water; to which, ſhould be added, a grain of ipecacuanha in powder, and ſix grains of ſyrup of kermes.

At night a proper doſe of diaſcordium, or ſome other ſtomachic, ſhould be given. The patient's ptiſan ſhould be Sydenham's white decoction; and ſhe ſhould be kept ſtrictly to broth, made with beef,

beef, and fowls of a year old; boiling, in every pot of it, three drams of harts-horn raſpings, tied up in a piece of linen; and employing, for this purpoſe, water, in which a red hot iron has been ſeveral times quenched. If it be found, that theſe remedies do not ſucceed, I am of opinion, that a doſe of *ipecacuanha* powdered, of twelve or fifteen grains, may be given to the patient, without danger; in order to empty the ſtomach: taking care, to aſſiſt the efforts to vomit by ſome diſhes of ſmall tea.

3° Laſtly, if the *uterus* be inflamed, the diſeaſe muſt be treated like an inflammation of the bowels; that is to ſay, by bleeding in the arm, in great quantity, and often, in the beginning; and in leſs, and ſeldomer afterwards: by giving the patient chicken broth, made into emulſion; and, for common drink, chicken water, and whey; adminiſtering clyſters of the ſame: by uſing emollient fomentations on the *uterus*; and even if the patient can bear it, thruſting the herbs of the fomentation into the *vagina*. Laſtly, by making the patient take oil of ſweet almonds, drawn without fire, beaten up with a third of the ſyrup of lemons, or marſh-mallows, in a ſufficient doſe to open the belly; and produce a gentle evacuation by ſtool. She ſhould be purged a little more ſtrongly, as ſoon as the diminution of the fever, and ſymptoms, evince the diminution of the inflammation.

CHAP.

# CHAP. XV.

## *Of the milk fever.*

### § I.

### DESCRIPTION.

THE second or third day after delivery, the woman finds herself afflicted with a swelling of the breasts, greater or less, and more sudden or gradual, caused by the abundance of milk, which comes thither: in which state the nurses say the milk rises.

This accession of milk into the breasts, more copiously, and quickly, than at other times, is made in several manners.

1° Sometimes the breasts swell gradually, for ten or twelve hours, so as to become more distended, larger, and firmer; but without pain, or fever. The swelling subsides soon after; and is intirely gone in two days. This is the *first state.*

2° At other times, the flow of milk, being more abundant, and impetuous, makes the breasts swell quicker, and more. The tumefaction, tension, and pain, are greater; and extend themselves into the arm-pits: which obliges the patient to hold her arms off from her body. This swelling begins without fever; but a more or less acute fever comes on, when it is more advanced; generally without shiverings; or, at most, with such as are slight and irregular. This is the *second state.*

3° At other times, the disorder begins by a brisk shivering, even to the degree of a shaking fit, that is followed by a burning fever, during which, the breasts rise very fast, so as to become hard, hot, red, and painful; which extends not only to the

the arm-pits, but even to the neck and cheſt: from whence the motions of the neck are rendered painful; and the reſpiration is conſtrained. This is the *third ſtate.*

Such are the effects of the milk in child-bed women. The antients * did not know them; or took no notice of them: and it was eaſy to do it, when the accidents were not attended with any fever: becauſe then they are ſcarcely perceivable; and go away eaſily. But when they are attended with, or perceived by fever, they merit more regard: for they are then a real diſeaſe. They call this fever, *the milk fever*, *febris à lacte:* becauſe it is the milk which cauſes it. This terminates in different manners.

1° Sometimes it continues only twenty-four, or thirty hours; and, at others, it laſts two or three days. It ſometimes happens, that it laſts longer: but then ſome other fever, of a different kind, is complicated with it.

2° When it laſts only twenty-four, or thirty hours, there is only one paroxyſm or fit; as in an *ephemeron* fever: but when it laſts longer, it returns every twenty-four hours; as a continued double tertian fever.

3° It ends generally in ſome conſiderable evacuations, by urine or ſtool; and, ſometimes, by a copious diſcharge of milky *lochia:* and then they ſay *the milk runs downwards.*

* Reinerus Solenander, is the firſt, as I believe, who mentioned the milk fever in a work, intitled, *Conſilia Medicinalia*, printed at Francfort in 1596.

I believe Thomas Willis was the firſt who ſpoke more amply of it, *In Tractatu de Febribus*, printed at the Hague in 1659, Cap. XVI. *De Puerperarum Febribus.*

## § II.

### CAUSES.

To account for the reaſon of the conveyance of the blood into the breaſts, which happens to child-bed women, we muſt go a little deeper; and refer to ſeveral facts, mentioned in the courſe of this work.

1° The vermicular, or lactiferous veſſels of the *uterus*, and the milky *veſiculæ* of the breaſts, have a great affinity to each other; and both are deſigned, from their original inſtitution, not only to ſecrete a lymph ſomewhat milky; that is to ſay, charged with ſome drops of chyle; but to receive the common lymph, which comes from the other neighbouring parts; that is to ſay, to the vermicular veſſels of the *uterus*; the ſubſtance even of the *uterus*; and the milky *veſiculæ* of the breaſts; and the exterior part of the cheſt.

2° That theſe veſſels of the *uterus*, as well as the *veſiculæ* of the breaſts, have each two conduits, in order to diſcharge as well the lymph, which is ſecreted there, as that which comes thither.

3° That, of theſe conduits, ſome are lymphatic capillary veins, which abſorb, from the cavity of theſe veſſels; and of thoſe of the *veſiculæ*, the lymph, which they contain; and convey; that is to ſay, thoſe, which come from the lactiferous veſſels of the *uterus* into the conglobate glands, that are in the higher part of the bifurcation of the iliacs; and thoſe which come from the lactiferous veſſels of the breaſts into the axillary glands.

4° That theſe conduits through the lymphatic veſſels are always open; in ſuch manner, that the lymph, which is in theſe ſeveral veſſels, or *veſiculæ*, is continually carried into the reſervoirs of lymph, according to the ſyſtem of circulation of the lymph: which,

which, with regard to the lactiferous veſſels of the *uterus*, and the lactiferous *veſiculæ* of the breaſts, muſt be conſidered only as a firſt reſervoir, or previous place of collection of the lymph.

5° That the ſecond conduit of theſe veſſels does not appear in the *uterus*, and breaſts, under the ſame form. That, with reſpect to the lactiferous veſſels of the *uterus*, theſe conduits are the paſſages, by which thoſe veſſels communicate with the cavity of the *uterus:* that they are very ſhort: and that, with reſpect to the *veſiculæ* of the breaſts, they are lactiferous canals, which terminate at the nipple, and carry the milk thither.

6° That the ſecond conduits are naturally ſtopt up; and open only on certain occaſions: as, for example, the mouths of the lactiferous veſſels in menſtruation; and pregnancy, for the nouriſhment of the *fœtus*; and, ſometimes, through the effect of diſeaſe, in the milky *fluor albus:* and the lactiferous canals of the breaſts at the end of pregnancy in the women, with whom the milk runs then from the end of the nipple; and in nurſes who wean a child that ſucks them.

7° That, from birth to the time of puberty, ſome of theſe *veſiculæ* do not ſecrete; nor conſequently contain any thing but a lymph, ſomewhat milky, though thin enough to be eaſily abſorbed by the lymphatic veins, without ſtopping in theſe veſſels: which, conſequently, muſt not ſwell either in the breaſts, or the *uterus*. Whence it proceeds, that girls have no breaſts till the time of puberty; and that the *uterus* remains flat and hard in them till then.

8° That, at this time, the girls not growing any longer, or only in a leſs degree, all the chyle, which they make, cannot be employed for their nutrition: and that a part muſt remain in the blood; and circulate there a long time; which gives occaſion to ſeveral chylous parts to mix with the uterine lymph;

lymph; and that of the breaſts with which they have an affinity.

9° That theſe two lymphs, become thicker, and more milky, by this mixture, and not being able to paſs ſo eaſily into the lymphatic veins, are retained longer in their own veſſels; that they dilate: which makes the breaſts large; and the *uterus* thicker, rounder, and more pulpous.

10° That things remain in this ſtate till the firſt pregnancy: but that then, as the converſion of chyle into blood becomes more ſlow, and the chyle ſtagnates longer in the blood, the milky lymph of the *uterus*, and that of the breaſts, are much more charged with chylous parts; become more milky, and thicker, and cannot be abſorbed, as uſually, by the lymphatic veins: inſomuch that the lactiferous veſſels of the *uterus*, becoming larger, force their mouths to open; and diſcharge the milk into the *placenta* and *chorion*, for the nouriſhment of the *embryo:* and that the *veſiculæ* of the breaſts, likewiſe, for the ſame reaſon, dilate the lactiferous canals of the breaſts; and provide themſelves a way to nouriſh the child, when it ſhall be born.

In this progreſſion of changes, which happens ſucceſſively, in the *uterus*, and in the breaſt, till the end of pregnancy, there is nothing advanced, that is not juſtified by experiment. There remains now only to examine what change delivery can make; and to explain, thence, the quick and copious conveyance of milk into the breaſts, which happens two or three days after the labour; and the fever, which precedes, or accompany this conveyance.

Nothing is changed, at leaſt obſervably, the two firſt days after the lactiferous veſſels of the *uterus* continue to receive the milk, and diſcharge it into the *uterus*, as before; but every thing changes its face, at the end of the ſecond day, or the beginning of the third.

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The *uterus*, which has begun to contract itſelf, by its elaſticity, as ſoon as a child is come forth, is ſufficiently diminiſhed, by the end of the ſecond day, or the beginning of the third, to contract the mouths of the lactiferous veſſels; and hinder them from diſcharging the milk, as they did before. The milk, therefore, being retained in the blood, and flowing with it, combines with the milk of the breaſts; and augments the quantity of it. This is the principle of the conveyance of the uterine milk into the breaſts.

This milk may be pure, and ſweet; or it may have a tendency to be ſour. In the firſt caſe, it would cauſe neither ſhivering, nor fever: but, in the ſecond, the conveyance would be affected with a greater or leſs degree of ſhivering, or fever; according to that of the acidity of the milk. This is the principle of the milk fever. We ſhall here explain both theſe caſes more particularly, by diſtinguiſhing them to three ſtates: in which the conveyance of the milk may be made: and which are thoſe that have been mentioned in the preceding article, in giving the deſcription of the diſorder.

I. The milk may be carried into the breaſts, in ſmall quantity, without precipitation, or cauſing any painful tenſion, in the three following caſes.

1° If the delivered woman be a little eater; has been ſober during her pregnancy; and has taken nothing but broth from the time of her being brought to bed. Becauſe, in all theſe caſes, ſhe will make very little chyle; and conſequently little milk.

2° If the *uterus* of the delivered woman be naturally lax; and has but little elaſticity. Becauſe it will be ſlow in contracting itſelf: and will preſs, conſequently, weakly and gradually the mouths of the lactiferous veſſels; that will continue to diſcharge much milk into the *uterus:* which will diminiſh,

miniſh, in proportion, what ſhould be carried into the breaſts.

3° If the mouths of the lactiferous veſſels, in the delivered women, are either naturally large, or already dilated by preceding labours, in which caſes, although rendered ſomewhat ſtraiter by the elaſticity of the *uterus*, they are yet open enough to ſuffer a great deal of milk to eſcape; which would be otherwiſe carried to the breaſts.

One of theſe cauſes alone is ſufficient to diminiſh the abundance of milk in the breaſts: but two together will diminiſh it much more; and, if three concur, the diminution would be ſo great, that the milk would hardly appear to riſe. Sober women commonly digeſt well: for which reaſon, the chyle they make, muſt be well elaborated and ſweet: and, conſequently, the milk, which it produces, muſt be, likewiſe, ſweet; and incapable of cauſing ſhiverings, and fevers; which are obſerved only in this firſt ſtate.

II. The quantity of milk, which is carried to the breaſts, will be much greater: which will make them ſwell conſiderably, with tenſion, redneſs, heat, and pain; but, nevertheleſs, ſuch as is tolerable in the three following caſes. And this is what is remarked in the *ſecond ſtate*.

1° If the delivered woman be a great eater; and has fed plentifully during her pregnancy; particularly ſince her delivery. Becauſe ſhe will have made much chyle; and will have, conſequently, much milk.

2° If the *uterus* has more elaſticity, and contracts more quickly, and ſtrongly: which, by cloſing more the mouths of the lactiferous veſſels, diminiſhes the efflux of milk, that would paſs out from thence; and makes it flow back readily into the breaſts.

3° If the mouths of the lactiferous veſſels be ſtrait, and have not been enough dilated by pre-

ceding births: which will make them close themselves more readily, and will free the greater part of the milk of the *lochia*, to pass into the breasts.

The abundance of milk in the breasts may come from one only of these causes: but it would be then moderately. It would be greater, if it came from two; and more so still, if it came from three of them.

Women, who eat much, are subject to indigestion, especially when they have, at the same time, a foul stomach, which often happens. The chyle, which they would make in an imperfect state, would turn acrid; and the milk formed of this chyle would participate of the same fault. The milk, therefore, badly compounded, would act upon the blood, as the febrile leaven of intermitting fevers; and, in particular, as that of the quotidian fever; that is to say, it would produce slight and irregular shiverings; which would be succeeded by a moderate fever, which would have several little fits. And this is what happens in the *second state*.

III. Lastly, the milk would go rapidly to the breasts; and cause a considerable swelling in them, with hardness, tension, heat, redness, pain, and hazard of inflammation: which would extend themselves to the arm-pits, neck, and chest, in the following cases: and this is what is observed in the *third state*.

1° If the delivered woman eat much; and her food be more of bad aliment than good. If she have taken no care of her regimen, in her pregnancy; nor had more regard to it since her delivery.

2° If the *uterus* have much elasticity; and contract intirely, and readily: and, consequently, close intirely and quickly the mouths of the vessels.

3° If these mouths be naturally very close; and have not yet been dilated by any birth.

It may be eaſily underſtood, by what has been already ſaid, how theſe cauſes, by augmenting the quantity of milk; or by intercepting all diſcharge of it into the *uterus*, muſt increaſe the quantity of that, which regurgitates on the breaſts: and it appears, that this effect muſt be as much more large; as there are a greater number of the cauſes, which concur at the ſame time.

In theſe women, the chyle, which they make, is generally worſe elaborated than in the preceding caſes: and is really acid, as well as the milk which it forms: inſomuch, that this milk, circulating with the blood, muſt produce then the ſame effect as the febrile leaven of the tertian fever; that is to ſay, cauſe a briſk ſhivering, ſo as to make a ſhaking fit, ſucceeded by a burning fit.

## § III.

### SYMPTOMS.

1° We have ſeen, by what has been ſaid, in ſpeaking of the *cauſes*, how the milk, by being carried abundantly into the breaſts, ſome days after delivery, ſwells them, by its volume, with tenſion, and hardneſs; how it produces pain, more or leſs acute, by diſtending them: and laſtly, how it cauſes there heat, redneſs, and even inflammation, by obſtructing the circulation; and forcing the blood to ſtop.

2° This ſwelling of the breaſts, with tenſion, hardneſs, heat, and pain, is communicated to the glands of the arm-pits, by lymphatic veſſels; which go from the breaſts to thoſe glands. As the milk, which they carry there is too thick to paſs eaſily; the greateſt part ſtops, and is accumulated: which produces ſwelling, tenſion, heat, and pain on the part; in ſuch manner, that the patients are ſometimes obliged to hold their arms at a diſtance from their bodies.

3° The ſame accidents ſpread themſelves, likewiſe, to the outſide of the cheſt; on account that the lymphatic veſſels of theſe parts, deſigned in their natural ſtate to carry the lymph, with which they are charged, into the lactiferous *veſiculæ* of the breaſts, cannot depoſit it there; becauſe theſe *veſiculæ* are too full; and remain ſurcharged: which produces, in theſe parts, an *œdema*; ſometimes phlegmonic, that hurts the reſpiration.

4° Sometimes even theſe accidents extend themſelves to the neck; when the lymphatic veſſels of that part cannot depoſit, as uſually, the lymph they are charged with, in the arm-pits, that are too full: which produces a painful *œdema* in the neck, that hinders it from turning.

5° Theſe accidents are more conſiderable in young perſons, at their firſt child-bearing: becauſe then have little regard to *regimen*; becauſe their uteruſſes have more elaſticity; and cloſe more exactly, and quickly, the mouths of the lactiferous veſſels: and becauſe theſe veſſels are ſtraiter, not having been before dilated by former births. On the other hand, in women, who have borne children ſeveral times, and who have more attention to their conduct, theſe accidents are ſlighter, for the contrary reaſons.

6° The quantity of milk, which ſwells, and dilates all the veſſels of the breaſts, dilates, alſo, often the lactiferous canals, which go to the breaſts. When this happens, the milk, that eſcapes from thence, diminiſhes the tenſion of the breaſts; and gives great relief. This accident is rare in the firſt births: but more common in the ſucceeding; eſpecially when the women have given ſuck. The nurſes ſay then, that the milk ſteals off through the breaſts.

7° In the ſame manner, the milk, that is accumulated in the lactiferous veſſels of the *uterus*, forces ſometimes their mouths, and opens them: which

which turns off a part of the milk that ſhould go to the breaſts; and thence procures eaſe. The nurſes ſay then, that the milk ſteals off below. This advantage is common enough in women, who have often borne children; but very rare at their firſt childbearing.

8° When theſe two ways fail; or, which is more common, when they are not ſufficient to exhauſt the milk; it is neceſſary, that the quantity, remaining in the breaſts, ſhould be diſperſed by way of reſolution; that is to ſay, it ſhould be taken up by the lymphatic veins, which carry it into the axillary glands; and that, being taken up there by other larger lymphatic veins, known under the name of the *roriferous veſſels of Bilſius*, it would be conveyed into the left ſubclavian vein, where it would mix with the blood. This reſolution is ſlow, and difficult. It is added by the lymph at the outſide of the cheſt, which paſſes into the breaſts; and there abſorbs gradually the milk, that ſtagnates in them; and, by the lymph, that comes back from the arms, which dilutes in the ſame manner gradually the milk, conveyed into the axillary glands; and puts it in a condition of continuing its courſe.

9° The milk fever, as well as the *ephemeron*, and the fits of intermitting fevers, go off generally by copious ſweats, or ſerous ſtools. Theſe evacuations diſcharge the milk from the blood, which had been carried thither, as is evinced by the milky ſmell of the ſweat, and urine; and by the milk, in ſubſtance, which is perceived in the ſtools.

10° When the milk goes to the breaſts in great abundance; and the reſolution, that ſhould be made there, is not performed, or but weakly; there remain indurations more or leſs hard, which give riſe to knots, ſchirrhuſſes, and cancers: as we ſhall ſee in the following book, where we ſhall treat of the diſeaſes of the breaſts.

11° It often happens, in the great repletions in the breaſts, that the reſolution of the milk is made imperfectly; and that there often comes on an inflammation in the breaſts, which ends in an abſceſs; and the abſceſs in an ulcer: but we ſhall ſpeak of theſe diſorders in *Book* IV.

## § IV.

### DIAGNOSTIC and PROGNOSTIC.

*Diagnoſtic.* Every thing is clear, with relation to the diagnoſtic. The milk fever is known, even ſo as to be foreſeen: the three ſtates of it are eaſily diſtinguiſhed: and, with a little knowledge of the theory of the diſorder, it may be perceived, to which of the cauſes it ſhould be aſcribed. This laſt inquiry, moreover, is ſcarcely neceſſary: becauſe it makes no difference in the method of cure.

*Prognoſtic.* The prognoſtic is ſcarcely leſs certain. The *firſt* ſtate of the tranſlation of the milk into the breaſts is without any danger; and requires no uſe of remedies. The *ſecond*, although a little worſe, does not demand much more the aid of medicines; provided the patient will conform to ſome proper management.

There is no danger then, but in the *third* ſtate: and this may ariſe, either from the breaſts, or the fever.

I. With regard to the breaſts, 1° The ſwelling, which the milk cauſes there in this ſtate, may bring on inflammation: and that may end in an abſceſs, or ulcer.

2° If the reſolution of the milk be not perfect, there will remain, in the breaſts, indurations; which may degenerate into ſchirrhous, and carcinomatous knots.

II. With regard to the fever, 1° If the milk, which cauſes it may be very acid, the fever will be conſiderable, and truly acute: in which caſe, it may occaſion

occaſion a ſurcharge of blood in the brain; and, conſequently, *ſtupor*, or *delirium*; the *coma vigile*; or an inflammation of the lungs; and, conſequently, a peripneumony.

2° If there be, in the *prima viæ*, a morbific diſpoſition; that is to ſay, a collected maſs of ſeveral bad digeſtions; this matter diluted by drink, or melted by fever, may paſs into the blood; and cauſe a double tertian fever: which would be attended with all the danger peculiar to that fever.

## § V.

### *Method of cure.*

I. The *firſt* ſtate is rather a regular proceſs of nature than a diſeaſe: and demands no more care, than it does remedy.

The breaſts muſt be kept covered with one or two compreſſes of linen, that is ſoft and worn: and a handkerchief muſt be likewiſe put round the neck; in order, that the heat may preſerve the fluidity of the milk; and hinder it from ſtagnating in the breaſts.

A ſlight decoction of maiden hair, or camomile, ſhould be given as the common drink: which ſhould be copiouſly taken; and always warm; the better to dilute the milk, and procure ſweats, a large diſcharge of urine; and an openneſs of the belly: which diminiſhes the abundance of milk.

There ſhould be given, every day, one or two clyſters, with the decoction of the leaves of mugwort, or mother wort; to which, ſhould be added, a little freſh butter; or oil of ſweet almonds.

Laſtly, the patient ſhould be kept to broth, till ſuch time as the motion of the milk is over; and the breaſts are nearly come again to their common ſize.

II. The *ſecond* ſtate demands the ſame care, and ſomewhat more of remedies.

The breaſts ſhould be kept warm; and well covered: and beſides, embrocations ſhould be uſed for them, twice a day, with warm oil of ſweet almonds, or camomile: covering them afterwards with cotton or wool; and putting compreſſes over it.

Clyſters ſhould be given, that ſhould be made a little purgative; by adding lenitive electuary; double *catholicum*; or white ſope.

The patient ſhould drink largely of a ſlight decoction of ſquills to attenuate, more efficaciouſly, the milk; and to put it in a condition of paſſing through the whole courſe of circulation, where it ſhould paſs. There ſhould be taken, at the ſame time, ſome cups, every day, of an infuſion of tea, or *veronica*, to produce the ſame effects more powerfully.

Laſtly, the patient ſhould be kept to broths yet more ſtrictly than in the preceding ſtate.

III. The *third ſtate* is a diſeaſe; eſpecially when the ſwelling of the breaſts is great and painful, and the fever ſtrong. For which reaſon, it is proper to join then, to the means already recommended, ſome proper remedies, to diminiſh the diſorder.

Inſtead of embrocations, the breaſts may be rubbed twice a day with honey melted, and yet warm: applying, over it, leaves of red cabbage, from which the large ſtalks are taken off, and that have been withered under the aſhes. The ſame applications ſhould be made under the arm-pits: but care ſhould be taken, not to apply oil of roſes, or vinegar, linen dipt in verjuice, or the lees of wine; as is practiſed: becauſe theſe remedies being repellent, may make the milk ſtop in the breaſts: which may have bad conſequences.

A large quantity of warm ptiſan ſhould be given; of which choice may be made, among thoſe, that have

have been propoſed: and a large quantity of tea, or infuſion of *veronica*, ſhould be drunk out of the paroxyſms; to dilute the milk; and procure copious ſweats, or diſcharges of urine.

Purgative clyſters, with lenitive electuary, or the *catholicum*, ſhould be adminiſtered: and there ſhould be even given, every morning, one or two apozems, with borage, and chervil; to which, ſhould be added, every day, a dram, or a dram and a half, of *ſal de duobus*, to provoke ſtools.

If the fever be great, and the ſwelling of the breaſts threaten to become inflammatory, it is proper to have recourſe to bleeding: which ſhould be in the foot; that it may not ſtop the *lochia*. In the ſame caſe, fomentations ſhould be made on the breaſts; and even cataplaſms ſhould be applied there. But we muſt refer, for this treatment, to *Chap.* II, and III, of *Book* IV; where the diſeaſes of the breaſts are ſpoken of.

It may be well judged, that, in this caſe, diet ought to be rigorouſly obſerved: and that nothing can be allowed, but broth and chicken.

But, after all, the moſt certain way, to prevent the danger of this laſt ſtate, is, to be ſucked; not by a child, nor a little dog, who do not draw ſtrongly enough; but by a grown-up woman accuſtomed to ſuck: who, doing it with force, opens, and dilates the lactiferous canals, in ſuch manner, that, beſides the milk, which it draws, that procures a certain relief, it occaſions an almoſt continual dripping of the milk, which quickly renders the breaſts ſoft. This was formerly done: but at preſent, the women, ſollicitous for the beauty, and the firmneſs of their breaſts, chuſe rather to ſuffer, and expoſe themſelves to danger, than to follow this method.

They perſue one directly oppoſite. As ſoon as the milk begins to flow, they make a great embrocation on the breaſts: they cover them afterwards;

wards; and then ſurround them with cotton wool: and they ſecure the whole with an handkerchief, or a napkin in four doubles. They do almoſt the ſame to the arm-pits, and neck: and the child-bed woman remains thus packt up, till ſuch time as the milk is put by: that is to ſay, they cloſe all the paſſages, by which the milk might find its way, to be diſcharged by the nipples. And this is what they call choaking the milk. We ſhall ſee, in the following book, in ſpeaking of the diſeaſes of the breaſts, the bad conſequence of this practice; as well with relation to the knots, which it leaves, as to the depoſits of milk, which it occaſions.

It has been ſaid above, in giving the deſcription of the diſorder, that the milk fever was often complicated with two other kinds, both dangerous.

The firſt, and the moſt dangerous, is a continued double tertian; which is produced by an accumulated maſs of bad digeſtions, collected in the *primæ viæ*, by the bad regimen, that has been followed. Theſe indigeſted matters, diluted by the great quantity of drink which the delivered woman is made to take, and melted by the milk fever, paſſes into the blood; and cauſes a continued fever, with paroxyſms more or leſs violent, according to the quantity and quality of the matter which cauſes it.

This fever muſt be, therefore, treated, as thoſe of the ſame kind in ordinary caſes, as far as the ſtate of the child-bed woman will admit of it: that is to ſay, ſhe muſt be bled once or twice in the foot; becauſe of the *lochia*, which ſubſiſt at this time. She muſt take, every morning, one or two apozems, with borage, and ſuccory; to which, ſhould be added, *ſal de duobus*; and in which even, ſhould be boiled, if it be neceſſary, a dram of the follicles of ſena; or of rhubarb; in order to empty the *primæ viæ*. She muſt be alſo ordered purges in form; if the violence of the diſorder require it. The patient ſhould, beſides, be kept to broth:

making

making her take a great number of clyſters, and ptiſans.

As ſoon as the fever begins to diminiſh, recourſe ſhould be had to the uſe of the bark.

The other is an inflammatory fever very acute; or, to ſpeak more properly, ardent; where the head is firſt ſeized; and the patient falls into a *ſtupor*, with *delirium*, or *coma vigile*.

The midwives, who are aware of the danger, and ſuſpect the cauſe, never fail to ſay it is a malignant fever: and it is true, it has the appearance of one. They loſe no time in aſſerting, at leaſt, that the diſorder does not proceed from the ſtate of the *uterus*, which is ſupple, and free from pain, although it be touched: all which is true: but the diſorder is at the neck and orifice of the *uterus*, which have ſuffered in a difficult labour; and perhaps even received ſome wound. There is nothing more required, to be convinced of this, than to preſs under the *pubes*; thruſting towards the neck of the *uterus*; and the patient will be found, notwithſtanding her *ſtupor*, to evince, by inarticulate complaints, that ſhe is hurt. Beſides the opening of women, who have died of it, have put this fact a long time out of doubt.

As this diſorder makes a rapid progreſs, it is proper to uſe diſpatch in the adminiſtration of remedies. It is requiſite, therefore, to bleed two or three times in the two firſt days; and the ſeat of the diſorder demands, it ſhould be in the arm: which ſhould not be neglected where there is a ſuppreſſion of the *lochia*. But if they flow, it is right the bleeding ſhould be in the foot. The patient ſhould be afterwards purged; at firſt, with minoratives; that is to ſay, with apozems: but it is proper afterwards to employ, without delay, the moſt efficacious purges.

The patient ſhould be kept, in the mean time, to chicken broth. She ſhould have many clyſters given

given her. She ſhould be made to drink copiouſly. Fomentations ſhould be uſed on the hypogaſtric region; and even emollient cataplaſms ſhould be applied there. Laſtly injections, with milk, and the decoction of marſh-mallows, ſhould be made into the *vagina*. But it is rare, that theſe remedies have ſucceſs. As the neck and orifice of the *uterus* are nervous parts, which are very ſenſible, the inflammation ſoon turns into a gangrene: and the patient is carried off, the ſeventh or the eighth day after delivery; and often ſooner; even ſometimes at the fourth.

## CHAP. XVI.

### *Of the obſtruction, or depoſit of milk.*

### § I.

#### DESCRIPTION.

THERE often happens, to lying-in women, conſiderable obſtructions of the fluids in different parts; ſometimes even in labour; and ſometimes a long while after.

They are generally œdematous: but ſuch as are harder than the common kind: and, alſo, more painful. They are particularly painful, when they become phlegmonic; which often happens.

Theſe obſtructions of the fluids, of what nature ſoever they be, are diſperſed generally by way of reſolution; ſometimes perfectly, and without leaving any bad conſequence; and ſometimes imperfectly, leaving one or more knots often very ſoft, in ſome inſtances indurated, and in others ſcirrhous. It is not even uncommon for theſe phlegmonic obſtruc-

obſtructions, to come to ſuppuration; and form abſceſſes.

They appear, ordinarily, in the exterior parts; as in the legs, thighs, arms, ſhoulders, and neck; and ſometimes, but ſeldom, in the interior parts; as in the glands of the meſentery, *thymus*, breaſt, and even lungs; which produce very bad diſeaſes; the deſcription of which, do not belong to this treatiſe. The laſt are not ſo ſenſible as the external ones; but are not leſs real: and ſeveral obſervations have put this truth beyond all doubt.

It is certain, as we ſhall ſee in the following article, that each of theſe accidents proceed from extravaſations, or *depoſits of the milk*. They were, formerly, rare, even ſo as to have been overlooked by authors. They are now become much more common, from the cauſes we ſhall explain below; but not ſo much as they would be, if we were to rely on the judgment of the patient, and midwives, whom they conſult; for they attribute all diſeaſes which happen after delivery, to an extravaſation of the milk.

## § II.

### CAUSES.

All the milk, which comes into the breaſts, except that, which eſcapes by the ends or nipples, muſt paſs from the breaſts into the axillary glands; and, from thence, into the blood. Therefore, in child-bed women, who have much milk, ſome muſt paſs into the blood; although free liberty be given, to all which can eſcape that way, to flow freely from the breaſts. But, other things being equal, much more muſt paſs in thoſe, in whom it is obſtructed; and in whom, the utmoſt care is taken to cloſe up all ways for its going off otherwiſe.

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This milk does not mix with the blood, where it is thus carried: becauſe the blood and milk are both too thick. But it mixes eaſily with the lymph which is in the blood; becauſe it is fluid enough to dilute it. Whence the lymph becomes milky; and, conſequently, thicker.

While the quantity of milk, which paſſes into the blood, is moderate; or what does paſs thither is not too thick, the lymph charged with this milk, although it be ſomewhat thick, is yet capable of taking its ordinary courſe, not only in the ſmalleſt lymphatic veins, but, alſo, in the collection of *cellulæ* of the conglobate glands, that it muſt paſs through: in which two caſes, the mixture of milk with the lymph does not bring on any diſorder: and theſe are the moſt common caſes.

But, if the milk paſs into the blood in great abundance; or that which paſſes be very thick; in theſe caſes, the lymph, which is charged with it, would be ſo thick, that it could not paſs through the conglobate glands; that it would be ſtopt in their *cellulæ*; and that it would ſwell them; and, conſequently the body of the glands: and this is the cauſe of the milky obſtruction. For it may be eaſily comprehended, that the lymph, which comes continually into the conglobate glands, cannot force a paſſage there: but muſt ſtagnate in their veins; dilate them; and produce an œdematous ſwelling.

An inference may be drawn from thence, which is confirmed by obſervations. It is, that the milky obſtructions muſt be more common in women of eaſy lives, than in poor women: becauſe the women in eaſy life, are better fed, and with more nutritious aliment: which produces too much blood; and too oily and thick a conſiſtence of it. But, after all, theſe accidents are never ſo common in any, as in thoſe who procure their milk to be obſtructed: and it is ſince the introduction of this practice,

practice, that the depoſits of milk are become ſo frequent a diſeaſe.

Theſe obſtructions are generally only œdematous: becauſe it is only the courſe of the lymph, that is intercepted, when the ſurcharged glands ſwell ſlowly. But they become phlegmonic, if the ſwelling of the glands be ſufficiently quick, to compreſs the blood around the veſſels ſtrongly, and hinder the circulation of blood.

Theſe depoſits of milk, of both kinds, happen commonly to the exterior parts of the body for two reaſons, which render the courſe of the lymph more ſlow and difficult there. The firſt is, that the lymph, paſſing to theſe conglobate glands, comes from the exterior parts of the body; which are expoſed to cold; and thickens it. The ſecond is, that it goes into glands, which are themſelves expoſed to cold: whereas in the interior parts, the lymph comes from places always hot; and goes to glands always ſubject to cold: which makes it preſerve its fluidity better; although it is equally charged with milky parts. For this reaſon, the depoſits of milk are more frequent in the legs and thighs, arms and ſhoulders, and neck and ears, than in the glands of the meſentery, the *thymus*, and the glands of the lungs; though theſe parts are not always exempt.

On the theory of the milky depoſits, which have been mentioned, it may be believed, that, as the cauſe, which produces them, is general, it muſt act upon all the conglobate glands; and produce an univerſal depoſit of milk. But it is eaſy to perceive, that this general cauſe is determined to act on certain glands, rather than others, through the difference of circumſtances: becauſe theſe are more cloſe than the others, and more difficult to be paſſed through; on account of their being more expoſed to cold; and more compreſt by the manner in which the patient lies in bed; or their having ſome blow; or ſome other difference; which, however, ſlight

ſlight it may be, is ſufficient to determine this general cauſe to act more on one part than on another. Such examples are not rare. Does not the cold act on all the parts of the body? Notwithſtanding which, it does not produce a rheumatiſm univerſally: but ſome local cauſe, often unknown, is ſufficient to fix its action, on one part in particular.

## § III.

### SYMPTOMS.

1° In the depoſits of milk, the *œdema* of the diſeaſed part is more firm and hard than in the common kind purely lymphatic: becauſe the milky humour, which forms them, is thicker than the lymph; and conſequently fills the veſſels better; and renders them leſs ſofter.

2° This *œdema* is more painful than the common one: becauſe the part, being more diſtended and leſs ſoft, the nerves muſt be more eaſily put in motion there: which makes the part more ſenſible.

3° The tenſion, hardneſs, and pain, muſt be yet greater in the milky depoſits, when the *œdema* becomes phlegmonic: becauſe then all the veſſels are fuller, and the nerves more tenſe, and eaſy to be vibrated.

4° It often happens that the milky lymph, which produces the œdematous depoſits, when it is accumulated; and the blood alſo that helps to render theſe depoſits phlegmonic, when it is obſtructed; reſume their ordinary courſe. On the one hand, the heat produced in the diſeaſed parts, puts theſe humours in motion; and the abundance of drink, that is given to the patient, breaks and renders them more fluid: and, on the other hand, the remedies that are applied to the part, relax the ducts through which theſe humours muſt paſs; and ren-

ders

ders them more pervious; in ſuch manner, that theſe humours eſcape gradually, and re-enter each into the current of the circulation proper to them; which occaſions the depoſit to diſappear by way of reſolution.

5° When the reſolution is perfect, nothing is left in the part: but there often remains a kind of kernel, which is the ſame knot, that cauſed the depoſit by its obſtruction. Sometimes this knot, though tumefied, is ſoft; and then the reſolution of it may be hoped to be intire. But, at other times, it is hard and ſchirrhous; and then the reſolution of it is long and difficult; and, often, very uncertain. In theſe caſes of the imperfect reſolution of the depoſits, the patients are ſubject to frequent returns of pain, on the leaſt variation in the temperature of the air.

6° That if the milky lymph, in the ſimple œdemas, and the blood in the phlegmonic, be too ſlow in reſolving, theſe humours, in conſequence of being expoſed to the heat of the part, and the oſcilations of its fibres, will change their nature; and be converted into *pus*; eſpecially the blood; as it is moſt diſpoſed to it: which will produce abſceſſes, that when they open would form ulcers, requiring a length of time for their cure; but of which the method of treatment does not belong to this treatiſe.

7° The apparent conglobate glands are thoſe, which are obſtructed the moſt often: becauſe they receive the moſt milky lymph refrigerated. From whence it comes, that the depoſits are generally round theſe glands. But it may be, nevertheleſs, in other parts; becauſe there is none, that has not ſeveral little conglobate glands, almoſt imperceptible. It is true, in ſuch caſes, the depoſits are ſmall; and proportioned to the ſize of the glands, which contribute to produce them.

## § IV.

### DIAGNOSTIC and PROGNOSTIC.

*Diagnoſtic.* The depoſit of milk in the exterior parts is viſible. It is proper, nevertheleſs, to know, how to diſtinguiſh it from the rheumatiſm, to which it has much reſemblance: but from which it differs, 1° In that the milky depoſits are not inflammatory; or rarely ſo; and in a ſmall degree. Whereas the rheumatiſm is always inflammatory; and in a great degree. 2° In that the milky depoſit is much leſs painful than the rheumatiſm. 3° In that the depoſit of milk comes after the bearing a child, when the milk has not been ſufficiently evacuated. Whereas the rheumatiſm comes in very different circumſtances. After all, the diſeaſe muſt be moderate, when it can admit of any miſtake of the diagnoſtic. Moreover, the remedies of the milky depoſits are proper in the rheumatiſm; or, at leaſt, can do no harm in it.

It is more difficult to diſtinguiſh the depoſits of milk in the internal parts. Nevertheleſs, if in the ſequel of a delivery, where the milk has been retained, there comes on, without any other manifeſt cauſe, a fixt pain in any internal part, which diſorders, or hinders the function of that part, there is reaſon to fear that ſome milky obſtruction is formed; particularly, if the ſeat of the diſorder be in any glandulous part. There then may be employed, without any imprudence, the remedies we ſhall below ſhew for depoſits of milk in general; and the more, as theſe remedies are ſo gentle, that they could not do any harm even in caſe of miſtake.

Laſtly, a certain judgment may be formed of the kind of the depoſit of milk, if it be exterior. As whether it be œdematous, phlegmonic, tending to ſuppuration, or already ſuppurated: becauſe this may

may be perceived, as well as the cauſe which produces it: which can be only one; the neglect of procuring the evacuation of the milk.

*Prognoſtic.* 1° Depoſits of milk are rarely dangerous: becauſe the milky lymph, which produces them, rarely turns to ſuppuration, or gangrene. But they are tedious, and difficult to cure: becauſe it is difficult to open the ducts of the obſtructed glands, by which the reſolution muſt be made.

2° The phlegmonic depoſits of milk are worſe, and more dangerous than the œdematous: becauſe the blood, which ſtagnates in the phlegmonic, renders them more painful; often brings on a fever; and gives room to apprehend ſuppuration, or gangrene.

3° The worſt of all is, the ſuppurated depoſit of milk: becauſe that the ulcer, which it cauſes, is foul, difficult to be deterged, and not in a condition to be healed; that all the milky lymph has not been evacuated; and there is even no means known for turning another way, that which comes there.

4° The internal milky depoſits are long in reſolving: becauſe reſolution cannot be procured by the effect of topical applications. But they ſeldom produce any miſchief: becauſe the heat of the parts, in which they are, preſerves, in the obſtructed milky lymph, a gentle heat, and a conſtant fluidity: which generally prevents all danger.

## § V.

### METHOD OF CURE.

In order to cure the depoſits of milk, it is neceſſary to endeavour to procure a perfect reſolution; and for that end, to accompliſh the three following indications. 1° To dilute the milky lymph, which ſtagnates in the depoſit, that it may be diſperſed more eaſily. 2° By diminiſhing the quan-

tity, as well in the depoſit, as in the blood; in order that the reſolution be ſoon made. 3° To relax the gorged glands, in order to make a paſſage for the milky lymph.

1° The firſt of theſe indications, may be accompliſhed by making the patient uſe, for her common drink, a great quantity of the infuſion of capillair, or camomile; or the decoction of the roots of *roſes* or *common reed*, cut into ſlices; by giving her, every day, ſeveral diſhes of tea, and even the Swiſs vulneraries; or the decoction of China root: by making her take every morning, faſting, a glaſs of a ſudorific, ſimple, or purgative ptiſan.

2° In order to accompliſh the ſecond indication, it is neceſſary, from the beginning, to bleed once or twice in the arm or feet, according to the ſtate of the *lochia:* if the depoſit be in a ſtate of great tenſion, painful, or inclined to inflammation; ſhe ſhould be made to take, every morning, an apozem of wild chicory, chervil, and water creſſes, in which ſhould be diſſolved a dram and an half of *ſal de duobus*. Beſides which, ſhe ſhould be purged, every four days, by ſome common form, proportioned to her conſtitution; and have each day, a clyſter, with the decoction of feverfew and mug-wort, to which, ſhould be added, lenitive electuary, or double *catholicum*.

3° Different external remedies are uſed, applied principally on the place of the diſorder; in order to endeavour to ſoften the obſtructed glands, ſuch as the cataplaſm *de Micâ panis*; rice boiled in milk, with which ſhould be mixed ſome ſpoonfuls of honey; linnen dipped in the warm mothers of ſalt-petre, which ſhould be renewed from time to time. The mothers of ſalt-petre, is the water which remains after the firſt cryſtalization of it.

4° As ſoon as it is perceived, that the uſe of theſe remedies has diſpoſed the diſeaſed part to reſolution, reſolvents ſhould be employed, in order

to

to promote it: ſuch as compreſſes dipt in ſpirits of wine camphorated, panada made with wine, a hemlock plaſter, &c. and what is very efficacious, very gentle frictions may be made on the part: which excites oſcillations in it, that are very neceſſary to procure the reſolution.

5° If it be perceived, that the depoſit begins to ſuppurate in any part, the ſuppuration ſhould be haſtened, by applying to it ſuppurating cataplaſms, made with the flower-de-luce root, roaſted on the coals; the pulp of marſh-mallows, or brank-urſine; ſnails; and, even, a little treacle: the whole bruiſed, and kneaded in a mortar; and ſpread on a linen cloth; or a plaſter of the *diachylum cum gummi:* and as ſoon as matter ſhall be formed, a vent ſhould be given to it, by making an inciſion on the moſt depending part. The wound, or ulcer, ſhould be dreſſed, according to the common method; which ſhall be hereafter explained, in ſpeaking of the abſceſs of the breaſts, *Book* IV. *Chap.* IV.

6° Laſtly, if the reſolution be not intirely made, and the obſtructed glands, inſtead of ſoftning, become harder; as this would be one cauſe of a continual pain in the part; it ſhould be endeavoured to procure a reſolution, by the application of a plaſter, compoſed of equal parts of the *emplaſtrum de Vigo q. m.* and the mucilage plaſter, mixed well together; by the internal uſe of chalybeates, or mercurials, not purgative, in order to dilute the milk, which is in the blood; and even by emenagogues, if the patient have her *menſes* irregularly; in order to evacuate, by the *menſes*, a part of the milk. In ſhort, for the laſt reſource, to ſend the patient to the thermal waters; that ſhe may make uſe of them; and have the diſeaſed parts pumped with them.

Theſe are the remedies recommended for the depoſits of the milk. I do not adviſe the employing all of them. For the greateſt part of the milky

depoſits need only a few; of which the moſt gentle ought to be choſen. But I have, I believe, remarked what ſhould be done in the worſt caſes. As to the reſt, it is neceſſary to make the patients obſerve a proper regimen, more or leſs rigorouſly, accordingly as ſhe is more or leſs inclined to fever.

## CHAP. XVII.

### *Of moles.*

#### § I.

#### DESCRIPTION.

A MOLE is an unformed maſs, heavy, generally ſpherical, without bone, and fibrous; produced in the *uterus*, in the ſame manner as a conception: and attended with the ſame inconveniences, as pregnancy; and ſometimes even much greater. The Greeks have called this kind of maſs Μυλη, by reaſon of its figure. The Latins, adopting this word, have named it *mula*; and the French and Engliſh *mole*, from the ſimple tranſlation of the Latin word.

I. There are moles of different magnitudes. Some are no larger than a man's fiſt: while, on the contrary, others are as big as a man's head. Theſe laſt ſort are exactly ſpherical; becauſe they are moulded by the *uterus* which ſurrounds them. The others are not moulded in the ſame manner; though they have a ſpherical figure; admitting ſometimes of angles; or, to ſpeak more properly, protuberances.

When this maſs is cut croſs-wiſe, it is found to be formed of a very great number of tendinous, or membranous fibres, that interſect it every way; the interſtices of which are filled with a pulpous, or ſpungy

ſpungy matter; whence no certain configuration of moles can be given.

Moles are not equally thick in all their circumference; the largeſt kind have, in the thickeſt part, at leaſt four fingers breadth; the others not ſo much. But, in both, this greater thickneſs is diminiſhed, and ſometimes is entirely wanting, on one ſide; in ſuch manner, that the thick part does not entirely complete the circle. In this place is always found, in the true moles, a ſpherical cavity; full of a lymphatic *ſerum*; and formed by a thick membrane. The magnitude of this cavity is not proportioned to the volume of the mole; and it is remarked, that it is ſometimes ſmaller in large moles, than in thoſe which are leſs.

There is found often, in this cavity, a little dried body, ſometimes as big as a large ant; ſometimes as a bee; and ſometimes much larger; hung to a very ſlender thread; which adheres to the membrane, that forms the bag on that ſide, where the ſubſtance of the mole is the thickeſt. We ſhall ſee hereafter, that this little body is the ſkeleton of a ſmall *embryo*. If the ſame has not been found in all moles, it is, perhaps, becauſe ſearch has not been well made; or that it has been diſſolved; to which its ſoftneſs expoſes it. This is known from what happens in the miſcarriages of the two firſt months, where ſometimes no *embryo* is found: which gives riſe to the belief of falſe germs, although very improperly.

Moles ſometimes adhere to the *fundus* of the *uterus*, like the *placenta*; which is common with large moles. For the ſmall ones float in the *uterus* without being attached to it.

Generally the mole is alone in the *uterus*. But there are good obſervations * which prove, that a

* Scholiographus Hollerii. *De morbis internis*, ad Caput *de Mola*. Marcellus Donatus, *Hiſtor. Medic. Miralilis*, *Lib.* IV. *Cap.* XXI.

child has ſometimes been found there with it: and that they come out ſeparately; the child with its coverings; and the mole alone in its own form.

II. There is another kind of moles more rare; but more regular. Theſe are the *hydatidic* moles; ſo called, becauſe it is only an hydatid knot; that it to ſay, a *compages* of tranſparent *veſiculæ*, full of liquid lymph. Theſe hydatids are of different magnitudes; from thoſe of the ſize of a grain of millet, to thoſe of a pidgeon's egg: and even larger. They have, each, a ſeparate pedicle; which is united with that of the next, in ſucceſſion; forming a kind of cluſter; of which all the parts are diſtinct, and float ſeparately.

I had an opportunity of ſeeing two of theſe moles. It was neceſſary for me to diſſect the firſt; becauſe it was imagined to be a monſter, the delivery of which was deemed ſhameful to the woman. I examined this mole with care; and it had one part wholly reſembling the ſubſtance of the moles which we have deſcribed above, which was about a third of the whole. All the reſt was converted into hydatids; which adhered to a part of the mole that remained. The ſize of theſe hydatids were very conſiderable. They filled a large bowl; and weighed at leaſt three times as much as a large mole: nor is it ſurprizing: for the lymph, which filled theſe hydatids, augmented much more the weight, than the mole could have done. The other mole, that I ſaw, was directly like the one I have juſt now deſcribed, but much leſs.

The ſubject I treat of, furniſhes a reflection, that I ought not to omit, on the ſlowneſs, with which diſcoveries in medicine are communicated and extended. Paul Portal *, ſurgeon-accoucheur of Paris, who lived in 1680, had an opportunity of ſeeing an hydatidic mole. The deſcription he made, and the figure he gave to it, admit of no doubt of the na-

* Practical Deliveries, *Obſerv.* 40.

ture

ture of what he obſerved. But, however, nothing was known from it, although hydatidic moles have been, from that time, exactly deſcribed.

III. There is a third kind of moles, which it is neceſſary to diſtinguiſh well from the preceding. Theſe are commonly of the ſize of a hen's egg; and they ſcarcely ever paſs that of a man's fiſt. They are abſolutely the ſame, with regard to ſubſtance, as the common moles: but are harder, and more compact: and have no cavity. Their figure approaches to that of a round. But they have points, and angles, the ſame as the ſmall moles of the firſt kind: and even more.

IV. It is impoſſible, to imagine, how many ſtories have been related concerning moles. I believe, it is the irregular figure of the ſmall moles of the firſt, and third kinds, that have, particularly, furniſhed occaſion to midwives and nurſes, to exerciſe their imagination. If credit were to be given to them, they have * ſeen women delivered of dead animals, as rats, moles, and tortoiſes: living animals, with four feet and crooked claws; ſuch as are called *harpies:* and moles even which fly about the chamber; and are known under the name of *flying moles.* Phyſicians have been credulous enough, to adopt theſe fables; and bold enough, to make them public. They have done ſtill more; for, to theſe

* I am inclined to believe, that miſapplying the word, the authors, who related thoſe obſervations, have called theſe monſtrous conceptions moles; which may be proper for all the pretended living moles; that ſhew, as they ſay, all the ſigns of palpitation, and even reſpiration, and motion. But admitting this excuſe for it; they cannot avoid agreeing, that they have been in general the dupes of their imagination, or credulity, when they have ſpoken of moles, which, when newly born, have run about the room with claws on their feet, or have flown up to the ceiling: as, among others, Cornelius Gemma, *De Divinis Naturæ Characteriſmis, Lib.* I. *Cap.* VI. Levinus Lemnius, *De Occultis Naturæ Miraculis, Lib.* I. *Cap.* II. Thomas Bartholinus, *Act. Haffnienſium, Vol.* I. *Obſervat.* 26. *pag.* 56, *&c.*

chimeras,

chimeras, they have added opinions, on the generation of moles, more abſurd, than the chimeras themſelves. I am ſorry, that phyſicians, who have had reputation in their time, have carried their credulity, and prepoſſeſſion, to ſuch an heighth. * *Moleſte fero tanta ingenia . . . . in tam leves, ne dicam, ineptas ſententias incidiſſe.* I have avoided loſing my time, by delivering, and much leſs ſtill, by refuting theſe opinions. It is ſufficient, to ſhew the truth; in order to overthrow all theſe fancies.

## § II.

### *Cauſes of moles of the firſt kind.*

I queſtion whether the antient phyſicians ever took the trouble to diſſect theſe moles. For the very ſlighteſt examination of them, they could have made, would have been ſufficient to elucidate their nature and formation. There is found in the mole, when opened, a membranous ſpherical cavity. This is the cavity of the *amnion* and *chorion*, where the *embryo* is naturally contained. That cavity is full of a viſcid lymph. It is the lymphatic *ſerum* of the cavity of the *amnion*, thickened. In that cavity, in the middle of the lymph, is found, ſuſpended, a little body, ſometimes longer, and ſometimes ſhorter: which is the body of an *embryo*, dried. It is ſuſpended by a little thread; which comes from the middle of it; and adheres to the membrane, that forms the bag, on the ſide where the ſpungy body, which makes the mole, is thickeſt. This is the umbilical cord of the *embryo*, dried; whence, therefore, it appears, that the umbilical cord of the *embryo*, after having entered the membranes, ends in the middle of the *placenta*.

* Cicero *De Natura Deorum, Lib.* I. 21.

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The following is therefore the true explanation of the word mole. A mole is a true conception, 1° When the *embryo* has periſhed, and is dried; together with the cord. 2° When the cavity of the *amnion* has remained, pretty nearly, as it was, when the *embryo* periſhed. 3° When the lymphatic *ſerum* of this cavity is gradually thickened. 4° When the *placenta* is ſo prodigiouſly increaſed, as not eaſily to be known again. When the explanation of theſe four facts is obtained, it may be preſumed, that the nature of moles, and the reaſon of their production, are known. This will, therefore, be the object of our preſent purſuit.

I. The *embryo*, in the two or three firſt months of pregnancy, is only a little gelatinous ſubſtance, and conſequently may ſuffer the ſlighteſt impreſſions. There is more reaſon to be ſurprized, that ſo many of theſe helpleſs *embryoes* eſcape, than that ſome of them periſh. A ſlight obſtruction, or a little tumour, in any part of the *placenta*, where the umbilical veſſels are diſtributed, ſufficient to intercept the circulation, between the *placenta* and *embryo*, deſtroys it. The leaſt obſtruction, or compreſſion in the length of the cord, may produce the ſame effect: which may alſo happen if the lymph, in which the *embryo* ſwims, be too ſaline, acrid; or be dried up. Laſtly, it may be occaſioned, by a thouſand unknown alterations in the body of the *embryo*; which may cauſe its death. Whenever there is no circulation, nor nutrition going on in the *embryo*, it muſt diminiſh and dry, even in the middle of the *ſerum* in which it ſwims.

The ſame holds good as to the umbilical cord. As ſoon as the circulation between the *embryo* and *placenta* ceaſes, the umbilical veſſels muſt be obliterated; and give occaſion to the drying of the cord.

II. The two membranes, which contain the *embryo*, the *chorion*, and the *amnion*, are nouriſhed, and increaſed, by receiving the blood furniſhed to them by

by the umbilical artery. But this artery does not any longer furniſh it when the *embryo* is dead: becauſe no circulation is then carried on between the *embryo* and the *placenta*. Therefore, theſe membranes cannot increaſe; nor the cavity, they form, enlarge: but they muſt remain in the ſame ſtate, in which they are, at the death of the *embryo*.

III. The lymph, contained in the cavity of theſe membranes, cannot be renewed, nor augmented; becauſe the umbilical artery, appropriated to that uſe, carries no more blood to it. It follows, therefore, that this lymph loſing conſtantly, by the heat of the place, in which it is confined, its thineſt parts becomes gradually thicker.

IV. As to the *placenta*, it increaſes conſiderably, at which there is no reaſon to be ſurprized. It adheres to the *uterus*; from whence it receives by the veinous *appendices*, and the mouths of the vermicular veſſels, all the blood and milk, which were intended for itſelf and the *fœtus*. Theſe two humours are diſtributed through all its ſubſtance, even by the branches of the umbilical artery, which preſerve there their proper cavity and functions. Thus, the *placenta* muſt continue to be then nouriſhed, and even much more than in pregnancy. Whence proceeds its being thicker and larger, even to ſuch a degree, as not eaſily to be known.

But this advantage is peculiar to thoſe placentas, which continue to adhere to the *uterus*; for all do not continue in that ſtate. To judge, by the diſtenſion of the cavity, which contains the *fœtus*, there is reaſon to conjecture, that moles are formed, in the ſecond or third months of pregnancy. For then the adheſion of the *placenta* is ſtill very weak; ſo that it often happens, that the *placenta* is then detached from the *uterus*, if the woman receive a motion any ways violent: and the more eaſily, as it is then more ſoft and fluid; becauſe it is deprived of the blood, which the umbilical artery carried to it.

It

It falls therefore into the *uterus*; in which it does not increaſe, but is preſerved. Theſe moles are ſmall, but nearly formed like the others; except that the *placenta*, being leſs, the origin of the mole is not diſguiſed.

As to the other placentas, that adhere more ſtrongly to the *uterus*, or which are not expoſed to the ſame violence, they continue to adhere, and increaſe. Their adheſion becomes even ſtronger every day, as their volume enlarges; and the moles formed from them remain ſtrongly adhering to the *uterus*, not only to the end of pregnancy, but oftentimes much longer. For there are obſervations to prove that women have borne moles fifteen months, two years, four years, and even the reſt of their lives. It may be very well imagined, that theſe moles become large when the *placenta* is intirely covered; ſuch are thoſe where the natural form of the *placenta* is the moſt altered.

## § III.

### *Of the cauſes of moles of the ſecond kind:*

The moles of the ſecond kind are thoſe formed by the *placenta*, which, inſtead of increaſing, as in the caſe of the preceding, are converted into a number of *veſiculæ*, full of lymph, or hydatids; adhering to one another each by its own pedicle, and fixt to a ſhapeleſs maſs, which appears to be the reſt of the *placenta*. I have ſpoken amply of hydatids in *The Treatiſe of Tumours*, *Book* III. *Chap.* II: where, after having mentioned, by what degrees the knowledge of them has been attained, I have explained the nature of them; and endeavoured to account for their production. It is, therefore, in order to avoid an unneceſſary repetition, I have thought fit, to refer to the above-mentioned work, thoſe who are deſirous to be informed on this ſubject.

It

It is sufficient to remark, that, in the hydatidic moles, which I have observed; and I believe it to be the same in all, there was in them a portion of spungy substance, wholly resembling that of the *placenta*; to which, all the hydatids hung. I believe this to be the part of the *placenta*, originally adhering to the *uterus*; which preserved its form at the time when the rest of the substance was changed into hydatids. I have searched in vain, to find out some *vestigia* of the two membranes; the *chorion*, and *amnion*. But as these membranes must have been very small, when the conception perished, there was no possibility of discerning any thing of it in the knot of the *vesiculæ*.

I do not take upon me to affirm, that the hydatid mole continues a long time adhering to the *uterus*. However the part of the *placenta*, which remained in the mole of that kind, which I examined, seemed to me not large enough to be able to support a long time, by its adhesion, the weight of the mole. It is, nevertheless, only during the time, that part of the *placenta* remains adhering to the *uterus*, the hydatids can be formed and inlarged. For, as soon as that adhesion is destroyed, and there is no communication between the uterine vessels and *placenta*, there cannot neither be any hydatids formed; nor can those grow bigger, which are already formed there.

## § VI.

### *Causes of moles of the third kind.*

We shall not dwell on this last kind of moles. It is certain, that they are greater or less pieces of the *placenta*, of some preceding delivery; which have remained in the *uterus*; float in it without adhering; and are there preserved, without giving room to suspect their being there. For these pretended moles

moles do not hinder, either the diſcharge of the *menſes*; or conception from taking place. Ruyſch has obſerved ſeveral of them *: as will be found, on referring to him.

## V.

### SYMPTOMS.

1° The moles of the two firſt kinds have been true conceptions; at leaſt till the ſecond or third month, and have conſequently been attended with all the common accidents of pregnancy, as diſguſts, irregular appetites, abſurd longings, heart-burn, ſickneſs, vomitings, &c. So that women have reaſon, at the beginning of moles, to believe themſelves pregnant; and they all do ſo accordingly.

2° Theſe flattering appearances vaniſh in the fourth month: becauſe then the child, if there be one, muſt begin to move; and that the mole abſolutely has no motion. However, oftentimes women ſtill deceive themſelves during this whole month; and find a pleaſure in continuing the illuſion. But the want of motion of the mole in the following month, deprives them even of the pleaſure of doubting.

3° Towards this time, there are moles which detach themſelves from the *uterus*, as has already been ſaid; and others, that remain in the *uterus*, without growing bigger. Thoſe are the ſmall moles. As to the others, which remain adhering to the *uterus*, they continue to grow, and inlarge very much.

4° The ſmall moles, which float looſe in the *uterus*, fall like a ſtone to either ſide, on which the woman lays herſelf. This is not the caſe with the large moles; which, by the adheſion they have with

* Obſervat. Anatomic. *Obſerv.* 28.
Theſaur. Anatomic III, IV. VII, & alibi.

the

the *uterus*, ſupport themſelves in the middle of the cavity.

5° As ſoon as the ſmall moles are detached, from the *uterus*, the milky veſſels, and the veinous *appendices* cloſe themſelves: the mechaniſm of the menſtruation is re-eſtabliſhed; and the *menſes* return again regularly. It is not the ſame, with the adhering moles, which continue to abſorb the blood and the milk of the *uterus*; and prevent, conſequently, the *menſes* from appearing.

6° With the ſmall moles, conception may take place: becauſe the *menſes* come on regularly. So that there are certain obſervations of women, who have lived to be old, though they have had one of theſe moles in their bodies. As to the large moles that prevent the *menſes*, they hinder alſo conception.

7° The hydatidic moles fill up the cavity of the *uterus*, without cauſing any other effect than rendering the belly large and weighty, as a child would at the full time. Hydatids are ſometimes ſeparated, and falling into the *vagina*, they formerly very much ſurprized the women who were delivered of them, and the people whom they conſulted.

8° As to the ſmall moles of the third kind, they neither occaſion ſwelling nor weight. Women, if very attentive, may, nevertheleſs, feel at times, that ſomething rolls in their bodies. But the greateſt part are totally ignorant of the matter, till they are delivered of them.

## § VI.

### DIAGNOSTIC.

The diagnoſtic is difficult; and requires a particular conſideration.

I. In

I. In the *firſt kind of moles*, thoſe that are large, which are the true moles, may be confounded with pregnancy, a dropſy, *ſchirrhus*, and *ſteatoma* of the *uterus*: but a little examination is ſufficient, in order to diſtinguiſh them.

1° In pregnancy, there may be felt the motion of the child, from the fourth even till the tenth month. In the caſe of moles, nothing of that kind is perceived.

In pregnancy, the hypogaſtric region is only tumefied in the middle part, where the child is placed lengthwiſe. In moles that are ſpherical, the hypogaſtric region is equally tumified at the middle and ſides.

In pregnancy, the belly riſes in a point towards the navel, where the head of the child bears. In the caſe of a ſpherical mole, the belly does not riſe to a point in any part.

2° In the dropſy of the *uterus*, the diſorders of pregnancy, as diſguſt, abſurd longings, bad digeſtion, and vomitings; are not perceived in the beginning of it: but they are perceived in the beginning of a mole.

In the dropſy of the *uterus*, the body of the *uterus* is equally large, and hard in the whole circumference. But in the mole it is more tumefied, and hard in its ſuperior part, to which the mole adheres, than in its inferior.

In the dropſy of the *uterus*, by puſhing on one ſide, there may be felt a ſmall counter-ſtroke, by applying the hand on the oppoſite; which is called ἀντίτυπια: and nothing of this kind is to be felt in moles.

3° In a *ſchirrhus*, there is not felt, in its formation, the diſorders common to pregnancy, and moles.

The *ſchirrhus* requires a great length of time, in order to become of a very ſenſible magnitude.

The mole, in five or six months, acquires a considerable volume.

A *schirrhus* presents a tumour resisting, and unequal; a mole, one that is soft, and unequal.

4° Lastly a *steatoma* of the *uterus* is not preceded by the disorders of pregnancy: but the mole is always so.

It must, however, be acknowledged, that steatomas, or other polypous excrescences of the *uterus*, have been mistaken for moles. They only adhere by a thin pedicle, that is broken in some effort; and this, I believe, is the circumstance, which has given room to say, that girls, and widows, have been delivered of moles, without having had commerce with man. There are observations, which authorize this conjecture.

The small moles of the first kind cause, in general, so few disorders, that they are but seldom perceived: and there is no occasion for being concerned, when they are ascertained to exist. The only signs, which appear to distinguish them, are the weight and uneasiness, women may feel in the hypogastric region, and the appearance of pregnancy that has preceded it; and which vanishes without any miscarriage. Large clots of blood, which have been detained in the *uterus*, and hardened there, have sometimes been mistaken for moles of this kind. But whoever has seen a mole, or even a *placenta*, can never be deceived in this point.

II. As to moles of the second kind, there is no reason to suspect their presence, but by the swelling, and weight of the *uterus*, succeeding the appearance of a pregnancy, that has disappeared. But it cannot be known, whether it be an hydatidic mole, till some of the hydatids, that are separated

* Ruysch, Observ. Anatom. *Observ.* 29.

from

from it, come away; which happens but very rarely.

III. Laſtly, as to the moles of the third kind, there being nothing to lead to the ſuſpicion of their exiſtence, it is unneceſſary to ſeek after the ſigns which indicate them. It would be very difficult to give them; as the moles can only be perceived, when they come away in a copious diſcharge of the *menſes*; or in conſequence of ſome delivery.

## § VII.

### PROGNOSTIC.

The prognoſtic reſts on two points. 1° What are the conſequences of moles contained in the *uterus?* 2° What hopes may be entertained of delivering the women of them, in whom they are found.

I. With regard to the firſt article, 1° The ſmall moles of the firſt kind, and thoſe of the third, are attended with no danger: becauſe they are ſmall, and being detached from the *uterus*, there is no fear of their increaſing.

2° The hydatidic moles are more voluminous, and heavy; and, conſequently, more incommodious. But they are, at the ſame time, not in a ſtate to grow bigger; becauſe they do not adhere to the *uterus*. Therefore they may be borne by habit.

3° There is only the large moles, properly ſpeaking, of which the conſequences are to be feared. Beſides their being already very large, they grow bigger every day, by the nouriſhment they receive from the *uterus*, with which it remains adhering; as has been ſaid before. Conſequently, they acquire ſometimes an aſtoniſhing magnitude, and weight. In this ſtate, beſides the diſorders they occaſion, they may, by compreſſing the blood-veſſels, and lymphatic veins, as well of the *uterus*, as *abdomen*;

and by hindering the courſe of the blood and lymph; cauſe a dropſy of the *uterus*, and the *abdomen*.

4° The moles of every kind remain a long time in the *uterus*, without ſuppurating; as Ruyſch * has remarked with regard to dead fœtuſſes, retained in the *uterus*. They may happen, however, to ulcerate in theſe two caſes. The one, when the patient is ſubject to a very acrid *fluor albus*. The other, when the moles are torn by dragging, in order to their extraction, without effecting it.

II. As to what concerns the ſecond article, 1° The coming out of the ſmall moles may be quietly waited for; becauſe they are ſeldom incommodious; and experience has ſhewn, that they often come out of themſelves, when the *menſes* diſcharge copiouſly; or when the patients, who may conceive, although they have ſuch moles, come to be delivered. Sometimes theſe moles even procure their own delivery, when the patient, making ſome effort, or falſe ſtep, puſhes them ſtrongly enough againſt the orifice of the *uterus*, to reach the *ſenſorium*, mentioned before in *Chap.* XIII. *of delivery*; which occaſions the impreſſions, cauſed there, to determine ſympathetically the contraction of the *uterus*, as they are applied to account for this in that chapter.

2° The hydatidic moles may, likewiſe, excite their own diſcharge by the ſame means. For the hydatids, which hang to its inferior part, in conſequence of elongating, reach to this *ſenſorium* of the interior part of the orifice of the *uterus*; and by irritating it, determine the ſtrong contractions of the *uterus*, which expel the mole.

3° The difficulty of delivering moles, is confined, therefore, principally, and even almoſt intirely to the large kind, which adhere to the *uterus*: and it is moreover theſe, that it is of the moſt impor-

* Adverſarior. Anatomic. *Decad.* II. *p.* 27.

tance

tance to have delivered; becauſe if they be left, they grow bigger and bigger.

In order to ſucceed in it, there muſt be two operations, both difficult and uncertain; inſomuch, that the attempt is often obliged to be abandoned.

It will be ſeen, in the article for the *method of cure*, in what theſe operations conſiſt. For to that muſt be reduced all the methods of curing moles.

## METHOD OF CURE.

The firſt of theſe operations is, to ſeparate the mole from the *uterus*, with which it appears to adhere more ſtrongly, in proportion to the length of time. It is neceſſary, for this reaſon, to begin to relax, and ſoften the *uterus*; by the uſe of warm baths, mineral waters, gently purgative, taken copiouſly; and even by emollient injections, ſuppoſing the orifice of the *uterus* to be open enough, to be able to introduce them.

After having perſiſted in the uſe of theſe remedies, during ſome time, it is neceſſary to employ active emmenagogues, in broths, apozems, and particularly boluſſes; in which ſhould be mixed a ſtrong doſe of the powder of ſteel, finely pulveriſed, ethiops mineral, or aperitive ſaffron of mars; and even ethiops mineral deflagrated; in order, that the blood, paſſing more abundantly into the mole, by the veinous *appendices* which adhere to it, a part of it may be diſcharged between the mole and the *uterus*; which will infallibly procure the ſeparation of it.

When there is reaſon to believe the mole has been moved, it is proper to make the patient jump ſeveral times together; or what is more commodious, to make her come down the ſteps of a pair of ſtairs, one by one, or two by two, with her feet cloſe together; to endeavour, by theſe ſudden and repeated motions, to detach the mole.

If there be ſucceſs, by theſe means, the mole falls towards the neck of the *uterus*; and there will be a diſcharge of blood by the veinous *appendices*; which will ſerve to relax the orifice of the *uterus*; and favour the delivery. But it will be neceſſary to moderate, and ſuppreſs it, if it be too copious, by the remedies, that have been propoſed before, in ſpeaking of the *menſes*, and the immoderate *lochia*.

This firſt operation being performed, a ſecond ſtill more difficult remains; which is the delivery of the mole. It is larger than the head of the *fœtus*; and, conſequently, it muſt paſs very difficultly through the orifice of the *uterus*. It does not move, conſequently it cannot excite the *uterus* to contract itſelf, and puſh it out, as the *fœtus* does, by kicking. Laſtly, its magnitude and roundneſs does not permit it to reach to the *ſenſorium* of the *uterus*; which, when it is moved, or irritated, excites quick delivery. Every thing tends, therefore, to render very difficult the coming out of the mole: and the moſt ſkilful *accoucheur*, whatſoever care he takes to dilate the orifice of the *uterus*, can ſeldom aid it; becauſe there is no means of taking hold of the mole.

But this manual operation, belongs to the *Treatiſe of the Art of Delivery*, to which I refer. It will be ſufficient to remark all that the phyſician can do in this caſe: which is, to give ſternutatory powders, or tartar emetic, in order, that the efforts, which the diaphragm, and the muſcles of the *abdomen*, will make on the *uterus*, in the ſneezing, or vomiting, may aid the expulſion of the mole. It is in the ſame view, there ſhould be then given irritating clyſters, with a pound of the decoction of the leaves of marjoram, and calamint; in which ſhould be boiled, a dram and an half of the pulp of *coloquintida*, folded up in a cloth; and with which, ſhould be mixt, half an ounce of *hiera picra*,

*cra*, and an ounce of *diaphenic:* or, rather, with a pound of the common emollient decoction; to which ſhould be added, an ounce of *diaphenic*, and two or three ounces of emetic wine; in order to excite the ſtrainings, which in the ſame manner cauſe the diaphragm, and the muſcles of the *abdomen*, to preſs the *uterus* ſtrongly.

End of the THIRD BOOK.

# TREATISE

ON THE

# Diſeaſes of Women.

## BOOK THE FOURTH.

### Of the diſeaſes of the breaſt, and the depravations of the milk.

## CHAP. I.

### *Of the ſtructure and uſe of the breaſts.*

THIS title ſhews, that two different ſubjects are to be treated of in this chapter: and that, conſequently, a diviſion of it, into two ſeparate articles, is neceſſary.

### § I.

### *Of the ſtructure of the breaſts.*

It is not propoſed to ſpeak here of the number, form, and ſituation of the breaſts; which are ſo generally known; nor to deſcribe the integument which covers them; that is to ſay, the ſkin, with its parts, which is the common integument of the body: as ſuch

ſuch a reſearch does not concern the ſtructure of the breaſts, nor belong to the ſubject before us. The parts only peculiar to the breaſts, and of which the knowledge is neceſſary for the underſtanding the diſeaſes of them, are thoſe now to be explained.

I. The firſt of theſe parts is a coat, peculiar to the breaſts, found immediately under the ſkin, and adhering to the pectoral muſcles. It is membranous, denſe, compact; and, what is ſtill more remarkable, furniſhed with many muſcular fibres, ſpread in all directions: and, conſequently, proper by their action, to contract, and compreſs, the body of the breaſts, which it encloſes. This contraction happens often, to women, who give ſuck, and have much milk; when the copiouſneſs of it, or, what is more common, when the irritation of the child, in ſucking the pap, excites, by a ſympathetic power, the contraction of theſe fibrous muſcles: and, even the ſimple *erethiſmes* of the tendinous fibres of the coat. At which time, the milk expreſſed, from the whole body of the breaſts, runs out copiouſly and ſpontaneouſly, from the ends of the paps: and ſometimes even with the force of a jet; which is called in French *epointe*, from the Latin word *expunctio*.

II. On taking off this covering, the body of the breaſt appears; which is formed of two different ſubſtances; of fat, and of a particular glandular body, that is the true ſubſtance of the breaſt. At the baſe of the breaſt, immediately over the pectoral muſcles, there is a very thick coat of fat, above which is the glandulous body, before-mentioned. Another coat of fat covers this body, at the top, and encompaſſes it, at the ſides. The quantity of this fat is not alike in all ſubjects. For women, who have large breaſts, have always more of it than others. This fat has no particular uſe, in the breaſts, or at leaſt, no other, than the defending them from, or diminiſhing the impreſſion of the

effects

effects of a blow, or compreſſion, on the glandulous body. It muſt, however, be obſerved, that there is found, in moſt ſubjects, many glandulous knots in this fat, particularly, in the ſuperior part; which are of the ſame nature as thoſe of the glandulous body: which have been ſpoken of before.

III. This glandulous body, the only part that merits our attention*, is of a circular figure, more, or leſs, large, or thick, in different ſubjects. The ſubſtance of it reſembles that of the *pancreas*; but more firm, denſe, and compact: which proves, that it is much compreſſed, by the tendinous threads which run croſs it in every direction. It is very apparent, that this body is compoſed of many diſtinct *veſiculæ*, or *cellulæ*, the ſame as that of the *pancreas:* and may be diſtinguiſhed, when it is macerated in warm water, or blown into by a pipe. It is, therefore, evident, that theſe *veſiculæ*, or *cellulæ*, of the glandulous body of the breaſt, ſerve to ſecrete, and contain the milk; as the *veſiculæ* of the *pancreas* ſerve to ſecrete, and contain, the pancreatic lymph.

It has been remarked, that the body of the breaſt ſuffers many changes, in different ages. In young girls, it is little: becauſe the veſſels are ſmall, and cloſe. It becomes larger, at the time of puberty; becauſe the veſſels are, then, dilated. It enlarges ſtill more in pregnancy; and, particularly, at the time when the woman gives ſuck. It diminiſhes, afterwards; and, in old women, grows ſo ſmall, that it is but little bigger than in young girls. Theſe changes may be obſerved in the *uterus*, and other parts, that ſerve for generation; becauſe generation, and lactification, being functions to be performed in youth, and middle age, it is only, at that time, the parts, which are ſubſervient to theſe purpoſes, ſhould have their growth.

* J. B. Morgagni, *Adverſar.* V. *Animadv.* IV.

IV. Every

IV. Every *veſicula* of the ſubſtance of the breaſt, hath two kinds of veſſels. *The firſt*, are two lymphatic veins: the one containing, in its cavity, not only the lymph, which comes from the ſubſtance of the breaſt; but, alſo, that which comes from the parts of the *thorax*, or cheſt, which are round it. *The other*, which diſcharges into their cavities, the lymph which has been conveyed there, and carried into the lymphatic glands of the arm-pits, from whence it paſſes into the right ſubclavian vein, through the other lymphatic veins, known by the name of *vaſa rorifera Bilſi*. The firſt of theſe lymphatic veins, which carry the lymph into the *veſiculæ* of the breaſt, are very ſmall; and bear the name of the *firſt* lymphatic veins. Thoſe which go from the breaſts to the glands of the arm-pits, are large; and ſeveral of them uniting together, form the larger, or *ſecondary* lymphatic veins, which terminate in the axillary glands. Laſtly, thoſe which carry the lymph of the axillary glands into the ſubclavian, called the *third lymphatics*, or of the *third order*, are ſtill larger.

V. In the breaſts, beſides theſe lymphatic veins, which are in continual and conſtant uſe, both in women and men, there are other particular veſſels which ſhould be deſcribed. They are never of any uſe in men; and only on particular occaſions, in women: that is to ſay, when they give ſuck. Theſe veſſels are the lactiferous ducts; called ſo becauſe they convey the milk to the nipple in ſuckling. There comes out of each *veſiculæ*, one, at leaſt, of a capillary ſmallneſs, eaſy to be diſtinguiſhed, in conſequence of the whiteneſs that the milk, of which it is full, gives. Theſe little capillary ducts, being joined ſeverally together, form the larger ducts: and, by repeated reunions, they form at laſt, under the baſe of the breaſt, only ſeven or eight very large ducts, which communicate together by the lateral *anaſtomoſes*;

*anaſtomoſes*; and terminate, at laſt, at the extremity of the breaſt; as has been ſaid before.

The reſt of the bore, or diameter of theſe lactiferous ducts, is not always equal. Theſe ducts are ſubject to dilatations, and oftner ſtill to contractions, which retards the courſe of the milk. There are women who give ſuck, in whom theſe contractions are very conſiderable: becauſe their milk flows ſlowly: and they have a great deal of trouble to make it come by ſucking. When this happens, the women are called in French *avares:* whereas, there are others, in whom theſe contractions are never found; and the milk flowing abundantly, the children are not fatigued by ſucking.

VI. It may be well conceived, that, beſides theſe particular veſſels, which have been mentioned, the breaſts have, as well as the other parts of the body, arteries, which carry the blood; veins which convey back the remainder of it, after the nouriſhing of the parts, and the ſecretion of the humours there made; and nerves which diſtribute the animal ſpirits. The arteries are two in number. *One*, which comes from the axillary, or thoracic artery, which is a branch of the axillary. This artery is diſtributed in the exterior parts of the breaſt; and bears the name of the *external artery of the breaſt.* The *other* coming from the ſubclavian artery; creeping under the back; paſſing between the cartilages of the ſides; and carrying the blood to the interior parts of the breaſt, is called the *interior artery of the breaſt.* There are, in like manner, two veins; one which comes from the outſide of the breaſt, and carries the blood to the axillary, or thoracic vein, which terminates itſelf in the axillary: this is the *external vein of the breaſt.* The other propels the blood into the interior part of the breaſt, paſſes between the cartilages of the ſides, and remounts towards the ſubclavian vein; which bring back the blood. This is the *internal vein of the breaſt.*

*breaſt.* The nerves come from the third and fourth pair of the *vertebræ*; they afford a large number of nervous fibres to the breaſt; eſpecially the nipples, whence ariſes the great ſenſibility of thoſe parts.

VII. The pap, in which the great lactiferous ducts end, is a cylindrical eminence that riſes in the middle of the breaſt, of a moderate ſize, neither long nor large, but varying much in different ſubjects. It is covered with a fine and thin ſkin, of great ſenſibility, and perforated with ſeven or eight holes, viſible to the naked eye; from which, the milk, that is brought from the lactiferous ducts, flows. Theſe ducts, which are incloſed in the paps, are parallel to each other, and ſeparated by the interpoſition of a ſpungy ſubſtance, which contains them without compreſſing them. It appears by this, theſe nipples are compoſed of many circular muſcular fibres, that contracting, ſhut up, elongate, rectify, and ſtiffen them: which happens when the ends are rubbed, or the child irritates them with the end of its tongue in ſucking.

VIII. Laſtly, the nipple is ſurrounded with a circle, which the nurſes call the *crown of the nipple:* and the anatomiſts, the *areola papillaris.* This circle, as well as the paps themſelves, are not white as the reſt of the breaſt, but of a brown colour: which muſt be attributed, as I apprehend, to the varicous diſpoſition of the cutaneous veins, that are ſpread there, in which the blood ſtagnates: whence the colour varies, according to that of the blood, which is red in girls, livid in women who give ſuck, and almoſt black in old women. There are, in this circle, many little glands, from which it is ſaid, ſome drops of a liquid, and white humour, may be ſqueezed out, which ſome pretend to be milk, and others to be a ſebaceous humour. * Morgagni is cer-

* Adverſ. Anatom. V. pag. 8—15.

tain,

tain, there are two kinds of veſſels which furniſh the two humours. It would perhaps be very difficult to decide their uſe; and it is of very little conſequence to us: as it does not regard the ſubject of which we treat.

## § II.

### *Of the uſe of the breaſts.*

We have ſhewn, that the *veſiculæ* of the breaſts have two kinds of excretory veſſels. The one is the lymphatic veins, which take up the lymph found there, and convey it to the glands of the arm-pits, where it follows the order of circulation proper for it. With regard to which, may be conſulted, *The Treatiſe of Tumours*, *Book* III. *Chap.* I. where we have ſpoken of the circulation of the lymph, on the ſubject of the *œdema*. The others are the lactiferous ducts, which contain the milk; and ſeparate, and convey it to the end of the nipple in the manner before-mentioned. The breaſts have, therefore, with reſpect to the lymph and milk, different uſes; which will be treated of ſeparately.

I. In regard to the firſt of theſe two uſes: the *veſiculæ* of the breaſts are a *reſervoir*, not only of the lymph, which is ſeparated by the ſubſtance of the breaſts; but alſo of that, which is brought to the neighbouring parts: and from thence the lymph is continually conveyed into the glands of the arm-pits: in which particular, the *veſiculæ* of the breaſt reſemble the glands of the center of the meſentery; participate of the utility of all the lymphatic glands of the body; and contribute to every advantage which the circulation of the lymph procures us.

This uſe of the breaſt is common, both to men and women, and exiſts in both ſexes, from the beginning

ginning of life to the period of death. It ſubſiſts in women without interruption, even when the milk appears to overflow their breaſts. For the circulation of the lymph through theſe *veſiculæ*, continues to be performed conjointly with the milk, which is then mixt with it. In this manner, the lymphatic veins, which paſs from the inteſtines to the glands of the meſentery, the lymphatic veins that paſs from the glands of the meſentery to the *reſervoir* of Pecquet, and the thoracic duct, likewiſe; ſerve to carry the lymph into the right ſubclavian vein, in animals who faſt: which does not prevent theſe ducts from conveying alſo the chyle, which is mixt with the lymph, as ſoon as the inteſtines ſupply it.

As the lymph, which mixes itſelf with the chyle, in the lymphatic veins of the meſentery, ſerves greatly to correct the imperfections of it; and facilitate its circulation: ſo, the lymph, blended with the milk, in the breaſts, contributes to dilute, render it more fluid; ſweeten the ſaltneſs, or acrimony of it; and facilitate its circulation: which are very important advantages that we owe to the goodneſs of the Author of our being; who ſeems to have made every thing highly uſeful to us. * *Natura conſultrix eſt, & provida utilitatum, opportunitatumque omnium.*

All the difference betwixt the mixture of the lymph and the chyle, and that of the lymph and the milk, is, that the two firſt of theſe fluids paſs together, into the right ſubclavian, by the ſame courſe: whereas the two other humours divide into two different *routes*; the milk with ſome of the lymph, which remains mingled with it, take the courſe of the lactiferous ducts, in women who give ſuck; and the lymph, with ſome of the milk, which it carries along with it, paſſes through thoſe lymphatic veins, which convey it to the glands of the arm-pits.

* Cicero II. *De Natura Deorum*, 58.

This

This is an additional reaſon for admiring the goodneſs of God, who ſeems to have intended by that, to prevent the choaking up of the breaſts; which would otherwiſe frequently happen to women who have plenty of milk.

II. The ſecond uſe of the breaſts, is to ſecrete, and contain the milk, for the nouriſhment of the child after its birth. This uſe is far from being a conſtant one; ſuch as that of ſerving as a *reſervoir* for the lymph. It is ſubject to ſingular variations. For a long time the breaſts have no milk: they afterwards have ſome, but in very different quantities, according to the occaſion. The milk at laſt diſappears; and not a drop remains there. What renders the ſurprize ſtill greater, is, that men who have breaſts, as well as women, though not ſo large; and nearly of the ſame conſtructure; have no milk, although in the age of puberty, they are nearly in the ſame circumſtances as women who have it. Theſe queſtions are curious; and, moreover, of conſequence to the knowledge of the diſeaſes of the breaſts, of which we are going to treat: which is a reaſon for our attempting to explain them.

1° There is no milk, properly ſpeaking, in the breaſts of girls, till the age of puberty; that is to ſay, till the fourteenth or fifteenth year. As, before that time, girls have no breaſts; and the *mammary*, or glandulous body of them, is ſmall and compact, there is nothing ſecreted in their *veſiculæ*, but a lymph charged, indeed, naturally with ſome parts of chyle, and conſequently a little milky; but which, nevertheleſs, is not milk. This lymph is fluid enough to flow freely through the narrow paſſages of the circulation of the lymph; nor does it ſtagnate in the *veſiculæ* of the breaſts, but iſſues out in the ſame quantity as it enters: which hinders theſe *veſiculæ*, as well as the breaſts which are formed by them, from inlarging.

2° At

2° At the age of puberty the cheſt is formed; and the breaſts begin to enlarge, from the following cauſe.

Towards this age, the growth of the body is completed in girls; or at leaſt near it: and they then conſume leſs blood, though they live after the ſame manner. They conſequently make more chyle than is neceſſary; which circulating a long time in the blood, in its original form, occaſions many of its parts to commix with the lymph of the breaſt; with which they have an affinity. By this means, the lymph becomes more milky, and at the ſame time thicker; which occaſions it to remain a longer time in the *veſiculæ* of the breaſts, that it dilates, and tumefies ſtill more, as well as the breaſts themſelves.

3° Things remain in this ſtate, till the women marry, and are pregnant, at which time the breaſts enlarge conſiderably, and become full of milk; and the milk which they contain becomes more perfect.

In pregnancy, the uterine milk, the diſcharge of which is ſuppreſſed, remains in the blood, and is mixed with the milk of the breaſts. The menſtrual blood, which is likewiſe ſuppreſſed, remains alſo in the blood; of which it augments the quantity; abates the circulation; and retards the converſion of the chyle into blood: inſomuch, that many parts of the chyle have time to mix with the lymph of the breaſts, to render it more milky and thicker; and occaſion the ſwelling of the breaſts: which effects continue to augment during the courſe of pregnancy, by the continual augmentation of the ſame cauſes.

4° Some days after delivery, the milk is carried abundantly into the breaſts of the lying-in woman: and makes them ſwell with tenſion and pain, attended always with a fever, in a greater or leſs degree.

This is called the *milk-fever:* of which we have ſpoken in the preceding book, *Chap.* XV. It is ſufficient to repeat here, that the impetuous flux of the milk into the breaſts at that time, ariſing from the diminution of the *lochia*, which makes the uterine milk flow back into the blood, by joining with the milk of the breaſts, raiſes this ſtorm.

5° The milk continues to be carried copiouſly into the breaſts of women who give ſuck, for two years, or thereabouts, provided they are drawn by a ſtrong child; and the *menſes* do not return.

A vigorous child, by drawing the breaſts ſtrongly, keeps the ducts open, and always ready to filter the milk. The ſuppreſſion of the *menſes*, as long as it continues, cauſes every thing that ſhould be diſcharged that way, to be carried to the breaſts. Whence, when the *menſes* return, the milk is divided between the *uterus*, and the breaſts: which laſt, by receiving a leſs quantity, grows flaccid. And it alſo reſults thence, that when the child does not draw with ſufficient ſtrength, the ducts of the breaſts contract, by their natural elaſticity; and refuſe an entrance to the milk.

6° In old women, who have no *menſes*, the breaſts grow flaccid, diminiſh, and receive no more milk.

This is a neceſſary attendant on age. It is known, that, in old age, all the fibres, membranes, and veſſels of the body, cloſe up from their own natural diſpoſition. This is the cauſe of wrinkles in all the parts; and alſo of the ſuppreſſion of ſeveral of the ſecretions, which ceaſe at that time.

7° Laſtly, notwithſtanding the actual conformity which there is betwixt the breaſts of men and women, the milk does not, in the natural order of things, paſs into the breaſts of men, even at the age of puberty; at which time the cauſe, that operates in girls ought, as it may ſeem, to act in the ſame manner in men; and produce the ſame effects.

But

But the difference is very great. In girls, the lymph is naturally milky, as has been ſaid; and, of conſequence, much diſpoſed to receive an alloy from the chyle, with which it has an affinity. Whereas, in men, that lymph is purely *lymphatic*; and does not ſuffer an union with any of the chyle.

What we have delivered, decides the greateſt part of the queſtions concerning the generation of the milk. It reſults from thence:

1° That the milk comes from the chyle: with which it has a perfect reſemblance, not only in its exterior qualities; but, particularly, in the configuration of the globules, of which both are formed. To admit that the milk is formed of blood, as the antients have believed, is multiplying operations without a neceſſity, by ſuppoſing the chyle is changed into blood, in order to have the pleaſure of ſaying afterwards, that the blood is changed into milk. The quickneſs, with which women who give ſuck, after having their breaſts drawn dry, perceive them fill again after they have eaten, proves clearly, that ſo much tranſmutation is not neceſſary to make the milk paſs thither.

2° That the milk comes from a chyle, which has paſſed the blood; circulated with it; and been ſubjected in the ſame manner to the action of the heart, and arteries: which muſt have attenuated, divided, ſweetened, and perfected it.

3° That the chyle is, alſo, prepared and ſeparated from the blood, by ſecretion in the membranes of the mammary *veſiculæ*; as the bile is ſeparated, in the liver, the pancreatic lymph in the *pancreas*, &c.

4° That it has been erroneouſly believed, the chyle paſſed immediately from the thoracic duct into the breaſts, without conſidering that ſo imperfect a chyle would make the milk thick, unequal, grumous, and aceſcent, and conſequently deficient in all the eſſential qualities of milk.

5° That the anatomiſts, who, too much prepoſſeſſed with this opinion, perſiſted for a long time to find theſe pretended ducts, which carry the chyle of the thoracic duct into the breaſts, ought to have been undeceived, by the ill ſucceſs of their reſearches; and their example ſhould undeceive thoſe, who may ſtill think as they did.

6° Laſtly, that the lactiferous duct which Pecquet * pretended to have ſhewn to Riviere, profeſſor at Montpellier, in 1654, in a bitch that gave ſuck, to the height of the third ſuperior rib, which bordered on the breaſt of the ſame ſide, and was full of milk, was not a veſſel that carried milk to the breaſt, as he believed, but a lymphatic vein, that carried to the arm-pits a milky lymph, it had taken up in the breaſt; as appears by the deſcription which Pecquet himſelf has given of it.

III. Nothing more remains than to know, how the milk comes out from the breaſts. In the greateſt part of the ſecretory organs of the body, the humours, that are ſecreted there, flow out of themſelves: as the bile, from the liver: the pancreatic humour, from the *pancreas:* and the *ſaliva*, from the ſalival glands. In ſeveral of theſe organs, there are ſuccours placed, that ſeem to facilitate theſe diſcharges; as the alternative motions of the diaphragm, and the muſcles of the *abdomen*, to diſcharge the bile and pancreatic humour: and the motion of the lower jaw, when ſpeaking, or eating, to diſcharge the *ſaliva*.

All this is wanting in the breaſts. However full they may be of milk, they let out none, but by the way of ſuction: at leaſt, unleſs the running out of the milk, in the time of the *expunctio* before ſpoken of, ſhould be reckoned a diſcharge. But this *ex-*

* *Diſſert. de Lact. Thor. Exper.* 4. It is proper to obſerve, that Pecquet did not know the lymphatic veins: as they were not, at that time, diſcovered.

*punctio*

*punctio* is an accidental, and almoſt momentary evacuation; which does not execute any of the intentions of nature. It is proper, therefore, to explain what the action of ſuction is, ſince it is the only manner of emptying the breaſts; and what there may be, perhaps, a difficulty in comprehending. But, in order to explain it, there is a neceſſity to go deeper into matters.

The air preſſes equally, by its weight, all the volume of the breaſts. So long as this *equilibrium* continues, the preſſure of the air on the body of the breaſt, cannot overcome that which acts on the nipple, nor force out one ſingle drop of milk. But theſe matters change, when means are found to break the *equilibrium*, and diminiſh the preſſure of the air on the nipple. The milk flows then in large drops, as of itſelf: of which there are many examples.

Women with milk, who have not a child to ſuck them, and feel their breaſts too full, have recourſe to this expedient, to empty them. They take a large glaſs bottle, of a cylindrical form; which contains four pints: ſuch as thoſe uſed for the Balaruc waters. They warm the end, and ſides of the bottle; and having put the nipple into the neck of it, which ſhould not be warm, and fixed it to the breaſts, they let it reſt in that poſition, till it grow cold. In proportion as the air grows cold, and condenſes, it preſſes the nipple leſs; and then the preſſure of the exterior air prevailing, makes the milk diſcharge drop by drop. This operation may, at pleaſure, be accelerated, by applying cold linen on the bottle; or by pouring water on it, to cool the air more quickly.

There is a ſecond inſtance, ſtill more ſimple. They procure glaſs veſſels, made on purpoſe, with a neck to embrace the nipple; a capacious body to contain the milk; and a pipe, at the back, which a perſon, who can hold their breath well, may put in

their mouth. Every inſpiration, that this perſon makes, a certain quantity of air is drawn out: and, as conſequently there is ſo much leſs in the bottle, the elaſticity of that, which remains there, is weakened, and of courſe the nipple leſs preſſed: which occaſions that the exterior air, continuing to act on the body of the breaſt with the ſame force, makes the milk come out from the nipple.

What they perform by theſe means, which art has ſuggeſted, the child, immediately after it is born, does without having learnt it; and in a better manner. It embraces the nipple with its lips; ſurrounds it as much as it can, with its tongue; and then makes an effort to inſpire: or, in other words, to ſuck: for ſuction is nothing but inſpiration. The air being then dilated in the mouth, has leſs elaſticity; preſſes leſs forcibly the end of the nipple; and yields to the action of the exterior air. The milk flows into the mouth of the child; and fills it: and, after having ſwallowed it, it repeats the ſame operation, which it finds agreeable, till ſuch time as it is ſatisfied. For this reaſon, children ſuck without trouble; whilſt adults, for whom women's milk is medicinally preſcribed, take a great deal of trouble in doing it, without being able to ſucceed.

CHAP.

## CHAP. II.

### *Of the painful ſwelling of the breaſts in women, who give ſuck; called the* coloſtratio, *or curdling of the milk.*

#### DESCRIPTION.

WOMEN, who give ſuck, are often expoſed to a ſwelling of one or other of the breaſts; but rarely of both at the ſame time; accompanied with tenſion; pain; heat; and, oftentimes, a little redneſs. When the ſwelling is great, the tenſion and pain extend as far as the arm-pit of the ſame ſide; and it is often felt to the hinder part of the back, at the height of the arm-pit.

This diſorder is, in general, only in one part of the breaſt more or leſs ſpread; and the ſwelling, which accompanies it, is not ſo uniform and equal, but to ſuffer the knots of the glandulous, or mammary body, which are obſtructed, to be perceived.

Sometimes this diſorder is very quickly formed, and in general, without any thing preceding to ſhow it; but ſometimes the patient perceives when it begins, a ſlight ſhivering: called by the phyſicians, *horripilation*; which is then followed by a fever, more or leſs ſtrong; that laſts generally twenty-four hours; terminates by ſweating; and is a kind of quotidian fever.

In this ſtate, if the diſordered breaſt be given to be ſucked, the pain augments. For which reaſon, however advantageous it may be to empty it as ſoon as poſſible, the nurſes refuſe to give it to the child: and the child, which can draw little or nothing from it, refuſes to take it.

This diſorder does not continue long; it terminates generally in two or three days, by way of reſolution. It is rare, that it laſts till the fourth or fifth day. When it exceeds this time, it is to be feared, that it will produce a ſuppuration; and form an abſceſs; or apoſtem; or that it may leave ſchirrhous hardneſſes in the breaſt.

The Greek phyſicians have called this diſeaſe Τυρωσις, which ſignifies a *clotting:* and the Latins, in tranſlating this word, *coloſtratio:* both being perſuaded, with reaſon enough, that the ſwelling of the breaſt comes from a *thickening*, or *curdling* of the milk. I know not why the French phyſicians have given it the name of *le poil.* Perhaps they have believed, this diſeaſe was the ſame with that Ariſtotle * has deſcribed, under the name of *morbus pilaris*; which he attributes to a hair's having been ſwallowed by a woman, who gave ſuck, that paſſes from the ſtomach to the breaſt. If it be ſo, that diſeaſe muſt owe its French name to a fable. For this account, by Ariſtotle, has no foundation in fact, as it is impoſſible, that a hair ſwallowed by a woman giving ſuck, ſhould paſs into the breaſt.

As this diſeaſe has no determined name, that is generally known and adopted, it muſt have different names in every place. I am ignorant of thoſe, which it bears in the different countries of Europe: and even of thoſe given it in many of the provinces of this kingdom. But I know that it is diſtinguiſhed in Languedoc, under the names of *thouras:* becauſe the diſorder is in the breaſt: and of *arcouſſel:* the etymology of which, I am not acquainted with.

## CAUSES.

It is evident, from the deſcription, which has been given, that the ſwelling of the breaſts in queſtion,

* Hiſtor. Animal. *Lib.* VII. *Cap.* II.

happen-

happening to women who give ſuck, comes from the choaking up of the milky *veſiculæ* of the breaſt, which are too full, in a certain compaſs, of a thick and coagulated milk; or which ſhortly becomes coagulated, on being ſtopt in that part. There are the greateſt proofs of it. For, on the one hand, by puſhing the fingers on the tumefied breaſt, the different knots of the mammary *veſiculæ*, ſwelled and full of milk, may be diſtinguiſhed: and, on the other hand, the diſorder, when it ends happily, terminates by the coming out of a thick and clotted milk, ſuch as the Latins called *coloſtrum*.

The proximate cauſe of the diſeaſe is thence underſtood; and all the phyſicians know it; as has been remarked. It remains therefore, to find out the antecedent cauſes, which give riſe to it; of which there are a great number.

1° Exterior cold, that has an effect on the breaſt; if the women, who give ſuck, be not careful to keep them covered; and which thickens the milk, in the lacteous *veſiculæ*; being then the moſt expoſed.

2° Any blow received on the breaſt ſtrong enough to bruiſe any knots of the milky *veſiculæ*; which weakens the elaſticity; and diſpoſes the milk, that abounds there, to be eaſily obſtructed.

3° The imprudence of women, that give ſuck, who have not attention to let the child ſuck properly, and who ſuffer too much milk to accumulate in their breaſts; or, neglect to give one of the breaſts to the child, becauſe they have ſome diſorder of the nipple.

4° The abundancy of milk, in a young and healthy woman who gives ſuck; which the child, being too young, or too weak, cannot empty completely; whence part ſtagnates in the mammary *veſiculæ*.

5° The diet, taken by women, who give ſuck, too nouriſhing and too ſucculent, furniſhes too much milk to the breaſts; which is too oily and thick. Whence it proceeds, that country-women, who come

to

to nurſe children in towns, in a good houſe, are more ſubject to the *coloſtrum*, than when they were at their own home.

6° The bad digeſtion that women who give ſuck have, in conſequence of eating too much; and almoſt conſtantly; whence there reſults a thick chyle, badly concocted, and inclining to be acid; which furniſhes a milk of the ſame quality, and conſequently, very apt to ſtagnate in the milky *veſiculæ*.

7° Laſtly, the different paſſions of the mind, by which the women are agitated; as grief, melancholy, anger, *&c.* which depraves the natural qualities of the humours; and conſequently that of the milk.

It will perhaps, be ſaid, that the cauſes, that have been mentioned, are general: and ſuch as act equally on the whole of both the breaſts, and which ought conſequently to excite an univerſal obſtruction: which does not happen in the *coloſtrum*, but only, in general, affects one breaſt, and that not equally in every part, as has been obſerved.

But 1° It cannot be ſaid, that the two firſt cauſes, which have been mentioned, exterior cold, and a blow on the breaſt, are general. They can only act on one breaſt, and even on one part of that breaſt: which is the manner they act in general.

2° In regard to the remaining cauſes, which are more general, there are ſeveral others, which interfering, modify, and reſtrain the action. There are women, that give ſuck, who have the lactiferous ducts ſtraighter in one breaſt than in the other, and in particular places of that breaſt. So that in theſe women, therefore, that breaſt, and that part of it, will be more expoſed to the obſtruction. There are ſome women, that give ſuck, who offer for the moſt part only one breaſt to the child; becauſe they have ſome diſeaſe in the nipple: for which reaſon, this ill-drawn breaſt is more ſubject to the *coloſtrum*, or *poil*. There are women alſo, who, without having any diſeaſe of the breaſt,

breaſt, have the bad cuſtom of holding the child more to one ſide than the other; and thus expoſing the ill-drawn ſide to thoſe cauſes which may produce an obſtruction of the milk. 4° Laſtly, the child oftentimes ſuddenly leaves off ſucking one of the breaſts; becauſe the end, or nipple, is too large, or too ſhort; or that it is not pierced with a ſufficient number of holes, to afford the milk copiouſly; and, on the contrary, will ſuck the other dry: which makes a great difference between the two breaſts; and occaſions, under the ſame circumſtances, the ill-drawn breaſt to choak up more eaſily.

## SYMPTOMS.

To account for the ſymptoms, it is only neceſſary to apply to each, the theory that has been explained.

1° In the *coloſtrum*, the diſeaſed breaſt is tumefied, by the ſwelling of the gorged mammary *veſiculæ*; and this ſwelling anſwers as well to the diſtenſion, and tenſion, as to the number, and degree, of the gorged mammary *veſiculæ* affected.

2° The ſurface of this ſwelling is unequal; which proceeds from the ſwelled mammary *veſiculæ*; and the knots of thoſe *veſiculæ:* which may be diſtinguiſhed through the ſkin of the breaſt.

3° This ſwelling is attended with more or leſs tenſion, according to the degree of ſwelling, and diſtenſion, it cauſes in the membranes and fibres of the breaſts: but, however this tenſion may be, it muſt not be confounded with the elaſticity.

4° This ſwelling is attended with pain, cauſed by the diſtenſion the tumefaction of the milky *veſiculæ* makes in the ſurrounding parts; in the tendinous fibres, which bind together the *veſiculæ*, and the knots which they form; and in the coverings of the breaſt.

5° This ſwelling is attended with augmentation of heat and redneſs in the parts, becauſe the tumefied

fied mammary *veſiculæ* compreſs the neighbouring blood-veſſels, and there retain the blood.

6° When the *coloſtrum* comes on ſlowly, and the ſwelling is moderate, it is formed without the patient's feeling it, or being aware of it; but when the ſwelling comes on quickly, and is large; the ſtrong diſtenſion, that is made in the breaſts, produces a ſhivering. It is in like manner, that the introduction of a probe into the bladder, when it is painful, is followed by a very quick ſhivering and fever. Sometimes alſo, this ſhivering, in the beginning of the *coloſtrum*, proceeds from an ill-concocted, and ſouriſh chyle, which paſſes immediately into the blood; and is one of the cauſes of the *coloſtrum*.

7° This ſhivering, from what cauſe ſoever it may come, is followed by a fit of an ague: which commonly happens. I do not propoſe to explain here, from whence this fever proceeds; any more than from whence proceeds the ſweating, and flux of urine, that happens when it begins to decline. This digreſſion, which would oblige me to go back even to the principles of the *Treatiſe on Fevers*, would carry me too far.

8° As in the *coloſtrum*, the milk does not flow by the end of the nipple, and the patient is not willing to be ſucked; becauſe the drawing gives them pain; a part of the milk which ſtagnates in the breaſt, muſt paſs into the lymphatic glands of the arm-pits, by the lymphatic veins of the breaſt; as has been ſaid before, in ſpeaking of the milk-fever. This ſwells theſe glands; and cauſes the pain that is felt there.

9° Laſtly, the glands of the arm-pits, being ſwelled, they cannot receive, as in general, the lymph that is carried there by the lymphatic veins; which come from behind the back. Theſe veins remain, therefore, ſwoln; and tumefy all the parts of the back, from whence they take their riſe; which cauſes the pain there. It is the ſame cauſe, that produces

duces the pain, which lying-in women feel at the back, in the milk-fever.

## DIAGNOSTIC.

I. The diſeaſe is eaſily diſtinguiſhable: and the *coloſtrum* cannot be miſtaken, when a woman, who gives ſuck, has one of her breaſts diſtended, painful, hot, and red. It ſhould not be confounded, however, with the inflammation, or a *ſchirrhus*, of the breaſts: which are eaſily to be diſtinguiſhed. In the inflammation, ſwelling, tenſion, pain, heat, and more particularly, redneſs, are much more conſiderable, than in the *coloſtrum:* and it is accompanied with a continued quick fever, that is not to be obſerved in the *coloſtrum*. As to the *ſchirrhus* of the breaſts, it will be ſeen hereafter in the chapter where we ſhall ſpeak of it, what diſtinguiſhes it from the milky ſwellings.

II. It is eaſy, alſo, to know the cauſes of the diſeaſe. The women themſelves, in relating what has preceded it, give an account of the particular cauſe to which it ſhould be attributed. But in the end, this knowledge is but little neceſſary; becauſe it does not influence, or but little, either in the prognoſtic, or the treatment.

III. The ſtate and degree of the diſeaſe ſhould be judged of by the violence of the ſymptoms. The diſeaſe is, therefore, a matter of conſequence, when the ſwelling, tenſion, pain, and heat, are conſiderable: and it is the contrary in all the oppoſite caſes.

## PROGNOSTIC.

I. The *coloſtrum* is a diſeaſe generally ſlight; and which is diſperſed by way of reſolution, in two days. There is even nothing to fear, when it is not diſperſed in three or four; if nevertheleſs the ſymptoms be not violent.

II. But

II. But this diſeaſe muſt be regarded, as of conſequence, when it continues more than five days, without giving ſigns of reſolution; or when the ſwelling, tenſion, pain, and heat, continue or augment; particularly, if a fever be conjoined with it, however ſlight it may be.

III. In ſuch caſe, there is reaſon to fear, the diſeaſe may turn to an inflammation, with which it has an affinity, which would neceſſarily produce a diſeaſe of more conſequence; more dangerous; and, generally, of longer duration: as will be ſeen in the following chapter.

IV. When the *coloſtrum*, without becoming inflammatory, is a long time in reſolving, it often happens, that the reſolution is not perfect; and that it leaves hardneſſes, more or leſs large, in different places; becauſe the delay of the reſolution, gives time for the milk to coagulate in ſeveral of the *veſiculæ* of the breaſts. Theſe hardneſſes, when neglected at firſt, become often ſchirrhous glands; as will be ſeen hereafter.

## METHOD OF CURE.

The intentions of cure that ſhould be propoſed in the treatment of the *coloſtrum*, have for their object, I. To alleviate the ſwelling, tenſion, pain, and heat of the breaſt, which is all that is neceſſary, when the diſeaſe is ſlight, in order to facilitate the reſolution of the milk, when it is ſtagnated. II. When the diſeaſe is in a greater degree, to attempt to reſolve, or gain a diſcharge to the milk, by more efficacious remedies.

I. When the diſeaſe is moderate, and it is almoſt always ſo, if a good opportunity be taken, it will be ſufficient to employ the following treatment.

1° To diminiſh the quantity of milk, that is brought to the breaſt, and which augments or ſupports the diſorder, the patient ſhould be kept to broths;

broths; and even very weak ones. As the diſeaſe is not of long continuance, it would, alſo, be well, to make uſe of the ſimple ptiſan, which would be the beſt.

2° To render the milk more fluid, and by that means, more proper to be diſcharged by the lactiferous ducts, or the lymphatic veins, which go to the arm-pits, the patient ſhould be made to drink plentifully of warm ptiſan, made with dried maiden-hair infuſed, or a ſlight decoction of ſquills, or roots of *calamus aromaticus arundinis*, cut in pieces.

3° To return the milk downwards, the patient ſhould take ſeveral anodyne, emollient, purgative, and hyſteric clyſters, according to the circumſtances in which ſhe is found.

4° To mitigate the pain, and relax the tenſion of the breaſt, embrocations ſhould be made with warm oil of lillies, or of camomile; applying on the part a cataplaſm of the crumb of bread, and milk; in which ſhould be mixed Narbonne-honey: or a cataplaſm of rice, boiled in milk; to which, alſo, ſhould be added, ſome of the ſame honey. Theſe cataplaſms ſhould be prevented from drying, by renewing them often.

5° The moſt eſſential concern is not to neglect to make the child ſuck the diſeaſed breaſt, as all women, who give ſuck do, to ſpare themſelves a little pain. But they ſhould be convinced, that ſucking the milk by the nipple, is the moſt ſure and expeditious method, to take away the ſwelling of the breaſt, and to cure it. In general, a little puppy dog is employed for this purpoſe; but it has not power to ſuck ſo ſtrongly as is requiſite. If the child be ſtrong enough to ſuck well, and to draw the clotted or thick milk, it may be ſuffered to do it on this account, without fear of expoſing it to any danger. Or elſe, to employ a more vigorous child, or what is ſtill better, a woman who profeſſes to draw women's breaſts, who may be eaſily procured.

II. If,

II. If, in ſpite of theſe remedies, the diſeaſe not only continues to the fourteenth day; but ſtill grows worſe; recourſe ſhould be had to remedies of greater efficacy.

1° The patient ſhould be bled in the arm, once or twice, according to the degree of the diſeaſe; which ſhould determine alſo the quantity of blood taken away. Inſtead of bleeding a ſecond time in the arm, ſhe may be bled once in the foot, that the menſes may be brought back.

2° If the tenſion, heat, and redneſs, give reaſon to fear the diſeaſe will turn to an inflammation; the uſe of all that have been above propoſed, ſhould be continued, to take down and relax the breaſt; and to diminiſh the pain, and obſtruction.

3° But, if there appear to be any ſucceſs, ſpeed is requiſite in employing proper reſolvents to hinder the ſtagnated milk from becoming hard: and not to avoid leaving in the breaſt, thoſe troubleſome hardneſſes.

4° For this reaſon, ſhould be employed, at firſt, a cataplaſm, made with four reſolvent powders; which ſhould be boiled in a decoction of any of theſe plants; ſage, mint, ſmallage, *apium*, or fennel, made into a kind of broth; to which ſhould be added Narbonne-honey, and oil of camomile.

5° If this cataplaſm ſhould not be powerful enough, another may be ſubſtituted; which ſhould be made with the pulp of the leaves of parſley and ſmallage, baked on the cinders, to which ſhould be added a third part of the ſeeds of fennel flower, *nigellæ*, with a ſufficient quantity of the oil of rue.

6° The patient muſt even be made to take, internally, once a day, the following powders. Of the ſeeds of fennel and cumin, powdered, each fifteen grains; of myrrh, and oriental ſaffron, powdered, each five grains. It may be left to her to chooſe how ſhe will take theſe powders; whether diluted

in

in ſome ſpoonfuls of broth; or made into a bolus, with a little ſyrup of *ſtæchus*.

7°. The patient ſhould, if the diſeaſe continue, be purged with an infuſion of follicles of ſena; rhubarb; and *ſal de duobus*; mixt with manna; or with two or three glaſſes of royal ptiſan; or with a pint of the water of *Vichi*; and an half paper, or a whole packet, if it be judged neceſſary, of the *ſelle de ſeignette*, or vegetable ſalt.

8° Laſtly, care ſhould be taken to have the breaſt of the patient ſuckt, three, or four times, a day, by a perſon who is uſed to it. In every caſe, the great bottle, of which we have ſpoken in the preceding chapter, may be employed. The end of it ſhould be warmed, and the neck applied to the breaſt, with the nipple within it: after which it is requiſite, to make the end of the bottle, quickly cold, by wrapping round it cold linnen, or wetting it with cold water, in order to procure a ſtronger ſuction; which will be ſufficient to draw a great deal of milk.

The other veſſel of glaſs, deſcribed in the ſame chapter, may alſo be uſed, by putting the nipple into the neck of it, and employing a perſon who has a good breath, and can draw ſtrongly, to ſuck, at the oppoſite end. The woman may even ſuck herſelf, if the end of the veſſel be long enough, and bent ſufficiently high, ſo that it might be conveyed to her mouth.

# CHAP. III.

## *Of the inflammation of the breasts.*

### DESCRIPTION.

THE inflammation of the breasts, is in fact the same with that of the other parts of the body: It only differs in respect to the nature, and use of the part which it affects. In other respects, it retains the five pathognomonic symptoms; which are proper to all inflammations. The inflammation of the breasts, therefore, is a tumefaction, with tension, heat, redness and pain; and comes, sometimes, in both breasts; but more generally in one only. A fever always attends the inflammation of the breast, unless it be very slight.

There are three sorts of inflammation distinguished, which, in fact are the same; or, which differ only in the degree. The inflammation of the *first* kind, or the simple *phlogosis*; in which the symptoms are slight, and go off without any bad consequences. The inflammation of the *second* kind; or the inflammation, properly speaking, in which the symptoms are of more consequence; but generally are dispersed by way of resolution. The inflammation of the *third* kind, the worst of all, generally turns to suppuration, and which, for that reason, is called *systrophic*.

The breasts are subject to this third kind of inflammation, in common with the rest of the body: but there is a peculiarity attending it, which is, that they are subject to it in these three states. 1° When the patients are in child-bed: 2° When they are not in child-bed, but give suck: 3° Which is most rare, when they are, neither in child-bed, nor giving suck;

ſuck; which makes ſome differences in the prognoſtic, and cure of the diſeaſe.

## CAUSES.

We have ſpoken of inflammations in general in the *Traité des tumeurs*, Book I. Chap. I. and, in particular, of the *Inflammation of the uterus* in that treatiſe, Book II. Chap. II. The theory of this diſeaſe is ſufficiently explained there; and it might be regarded as an uſeleſs repetition, of the ſame matter, to treat too long of it here. It will be ſufficient to remark, in a few words, the general principles, which ſhould be had in view, when the cure of the inflammation of the breaſts is undertaken. If a more particular account be deſired, the places referred to may be conſulted.

It is certain, that the inflammation of the breaſts of the *firſt* degree, proceeds from the circulation of the blood being abated, and retarded in the parts affected; or, when the diſeaſe is greater from the circulation of the blood being intercepted in thoſe parts.

This retardation, or interception, is produced by compreſſion, obſtruction, or contraction of the veſſels, in which it happens: accordingly as theſe cauſes act more or leſs efficaciouſly.

The inflammation of the *ſecond* degree, proceeds from the blood, in conſequence of its ſtagnating in certain capillary veſſels, and dilating them, as alſo, at the ſame time the orifices of the lymphatic veins, that ſpring from them, to ſuch a degree, that it is capable of entering them; which augments the redneſs, heat, tenſion and pain, in the parts: and, conſequently, the inflammation. This change only proceeds, as has been ſeen, from the continued action, or augmentation of the cauſes; which retards, or ſtops the circulation of the blood.

Laſtly, the inflammation of the *third* degree happens, when the blood, in conſequence of dilating the capillary veſſels, in which it is ſtagnated, or the lymphatic veins into which it has deviated, burſts the one or the other, or even both at the ſame time; which cauſes an extravaſation of the pure blood; or of lymph intermixed with blood. This extravaſation comes, as has been ſeen, from the too great fulneſs of the veſſels; which depends on the continued action of the cauſes, that retard or ſtop the circulation.

It follows from thence, that the three kinds of inflammation, of the breaſt, proceed from all the cauſes, which retard, or ſtop the circulation of the blood; and which, as has been ſeen, produce the inflammation of the *firſt* degree;—that theſe cauſes, being continued and augmented, produce the inflammation of the *ſecond* degree:—and, that, laſtly, if they be not remedied, at that time, they produce the inflammation of the *third* degree. Therefore, in ſearching for the cauſes of theſe inflammations, attention ſhould not be given to any, but thoſe which produce, that of the *firſt* degree.

Now theſe cauſes are, as has been ſaid, compreſſion, obſtruction, contraction, or ſtrangulation of the blood-veſſels. I believe even that the obſtruction, and ſtrangulation of the veſſels, have not any part, in the inflammations of the breaſts; and, on that account, there is no occaſion to apply ourſelves further, than to know what may compreſs thoſe veſſels. In order to do this methodically, as the breaſts may be inflamed in three ſtates, when the women are in child-bed; when they are not in child-bed, but give ſuck; and when they are neither in child-bed nor give ſuck; it is neceſſary to explain firſt the cauſes of inflammation of the breaſts, which are common to theſe three ſtates; and, afterwards, to proceed to thoſe, which are particular to each of them.

1° The common cauſes of theſe three ſtates are, a blow on the breaſt, a bruiſe, or a ſtrong compreſſion; becauſe

becauſe theſe cauſes may weaken the elaſticity of the *veſiculæ* of the breaſts; and occaſion, by that means, an obſtruction of the milk that may compreſs the blood-veſſels; to which may be added exterior cold, that thickens the milk, retained in the *veſiculæ* of the breaſts; and compreſſes the blood-veſſels, that ſurround them.

2° Beſides theſe common cauſes, inflammation of the breaſts may come in lying-in women, from a ſudden ſuppreſſion of the *lochia*; which carries the uterine milk in abundance to the breaſts; ſwells them; and intercepts there the circulation. The ſame thing happens, often, when it is endeavoured to ſuppreſs the milk, in a young perſon, and ſhe is ſuffered, at the ſame time, to eat much.

3° With regard to the women who give ſuck, two particular cauſes may be the means of the inflammation of their breaſts; the firſt, the *coloſtrum*, when it is very conſiderable, and a diet proper in that ſtate is not given: the other, the great abundance of milk, when the child has not ſtrength to drain it; or when the woman ceaſes on a ſudden to give ſuck, without taking the neceſſary precautions, to dry up the milk gradually.

4° Laſtly, if the inflammation of the breaſt happen to a woman, who does not lie in, and who does not give ſuck, which is very rare, it proceeds in general, from ſome one of the common cauſes. I only know of one particular cauſe, that may contribute to it; an obſtruction of the *menſes*, happening to a young perſon; becauſe then, the uterine milk is carried more abundantly to the breaſts. For, as the milk is very thick, for the reaſons, that have been ſhewn before, it particularly cauſes an obſtruction, when there is too great a quantity at firſt.

It muſt be obſerved, that the ſeat of the inflammation often varies; ſometimes the ſkin of the breaſt is more affected than the interior part; and then it is principally in the ſkin the patient feels the pain, ten-

ſion, and heat. At other times, the diſeaſe is more in the interior parts of the breaſts, than in the ſkin; and then the tenſion, pain, and heat are principally perceived within the breaſt.

## SYMPTOMS.

The ſymptoms of the inflammation of the breaſts are eaſy to be explained.

1° The *veſiculæ* of the breaſts, the lactiferous ducts, and the blood-veſſels, are full of milk and blood; whence come the tumour, and tenſion of the inflamed breaſt.

2° In the inflammation of the breaſts, the blood, which is retained, is ſubjected to lively and repeated oſcillations of the arteries: whence proceed the redneſs, and heat of the inflamed breaſt.

3° All the veſſels, of the inflamed breaſt, are greatly diſtended by the milk or blood: whence comes the pain, that the patient feels, in the inflamed breaſt.

4° As to the fever which accompanies the inflammation of the breaſts, as it attends all conſiderable inflammations, it ariſes from the acuteneſs of the pain, the patient feels; and, for that reaſon, it is in proportion to the degree of pain.

## DIAGNOSTIC.

I. It is eaſy to diſtinguiſh the inflammation of the breaſts by the combination of the pathognomonic ſigns, which characterize it. Theſe are tumour, tenſion, redneſs, heat, pain and fever, which generally attend it.

II. The inflammation ſhould not be confounded with the *coloſtrum*; but it is eaſy to be diſtinguiſhed from it, as well becauſe there are ſymptoms in the inflammation, that are not to be found in the *coloſtrum*, ſuch as redneſs and fever; as becauſe, the other ſymptoms, which

which they have in common, are much more violent in the inflammation than in the *coloſtrum*.

III. The degrees of inflammation are alſo eaſily known, by the violence of the accidents, and the duration of the diſeaſe.

IV. It is very eaſy to know, if the patient be in child-bed, give ſuck, or be in neither ſtate.

V. Laſtly, by queſtioning the patient on what preceeded the diſeaſe, it is eaſy to judge of the cauſe, which has given riſe to it: which is of very little conſequence; becauſe the treatment is always the ſame.

## PROGNOSTIC.

I. The inflammation of the breaſts is a diſeaſe of long continuance: becauſe the milk is a thick humour, difficult to be liquified, in order to be diſperſed by way of reſolution; or to be ſuppurated, in order to form an abſceſs.

II. It is a painful diſeaſe, in conſequence of the ſenſibility of the breaſts; which proceeds from the great number of nerves, that are diſtributed there.

III. But it is ſeldom, that this diſeaſe is fatal, unleſs when it is abſolutely neglected, or what is worſe, when hurtful remedies are applied to it.

IV. This inflammation terminates in different manners, by way of reſolution, which is a complete cure of it; by way of ſuppuration, which forms an abſceſs or apoſtem, of which we ſhall ſpeak in the following chapter; and by hardening the ſeveral parts, which leave knots, and oftentimes even ſchirrhous glands; as ſhall be ſeen in the following chapters.

V. This inflammation does not turn into a gangrene; or, at leaſt, I do not know an inſtance of it: which I conceive ſhould be attributed to the quality of the milk, that keeps the parts in a ſupple ſtate, and prevents the gangrene.

## METHOD OF CURE.

The remedies, which are ſuitable to inflammations of other parts, are proper in thoſe of the breaſt, ſome caſes excepted, that will be obſerved in the ſequel.

I. Among the remedies, that belong to the interior method of cure, 1° Bleeding is the moſt efficacious. It is by that, the cure ſhould be begun, and the two or three firſt bleedings ſhould be of ten ounces each. The beſt way is to make them in the arm; and in that, which is oppoſite to the diſeaſed breaſt. This rule ſuffers no exception in women who give ſuck; nor in any other. This matter merits ſome conſideration, with regard to child-bed women. If the *lochia* be abundant, and the inflammation of the breaſts be moderate, bleeding ſhould be omitted: but it is neceſſary to bleed the patient, if the diſcharge of the *lochia* be but ſmall; and even when the diſcharge of the *lochia* is copious, if the inflammation of the breaſts be violent. But, in lying-in women, the bleedings ſhould always be in the feet: and the two or three firſt ſhould be from nine to ten ounces, if the violence of the diſeaſe require it. They ſhould moreover be repeated, according to the neceſſity of the caſe, and ſtate of the patient

2° A ſtrict diet ſhould be ordered, and the patient confined to ſimple veal or chicken broth, and ptiſan; ſo long as the inflammation is great and the fever ſtrong. This rule is general. Nevertheleſs it muſt be diſpenſed with in the caſe of lying-in women who give ſuck, and will obſtinately do ſo; permitting them to have one or two meſſes of broth with a little creed rice, every day, in the remiſſion of the fever; and obſerving to revoke this permiſſion, if the fever be perceived to augment, in which caſe it is beſt not to allow it.

3° It muſt be recommended to the patient, to drink much of the infuſion of maiden-hair, or the flowers

flowers of mullen, of the decoction of quick-grass or the root of sorrel; of whey made without cream of tartar, or of chicken water; in order to moderate the heat of the blood; and to procure a copious discharge of urine and sweat; by which means the redundant part of the milk, must be discharged. This rule relates equally to all women, who have an inflammation of the breasts, in whatsoever state they be.

4° It is important to give the patient, one or two clysters every day; sometimes simply anodyne, or emollient; and sometimes a little purgative; to which, should be added mercurial honey, oil of olives, lenitive electuary, or double *catholicum*. Child-bed women are less proper subjects of the severity of this rule: for decoctions of mugwort, feverfew, or melilot, are preferably given to them.

5° Besides the clysters, it would be well to give, every morning, to the patient an apozem, made with the leaves of wild chicory, borage, and spleenwort; in which should be dissolved, a drachm, or a drachm and a half, of *sal de duobus*. Child-bed women, when there is a good discharge of the *lochia*, are an exception to this; but it should be adhered to if the *lochia* be suppressed.

6° When the fever is diminished as well as the tension, pain, and heat of the breasts, the patient should be given a common purge, with a dram of rhubarb and a dram of the vegetable salt (or *selle de seignette*) in infusion; to which should be added, in the morning, two ounces of manna; or two or three glasses of royal ptisan, made with two drams of the follicules, two drams of *sal de duobus*, and a lemon cut into slices; of which should be made two doses; and, to each should be added an ounce of manna. This purge should be repeated, when found proper. But it should not be put in practice with lying-in women, unless the *lochia* are ceased, suppressed, or much diminished.

7° If

7° If, in the courſe of the diſeaſe, the pain be ſo acute, that the patient have not a moment's reſt, it ſhould be endeavoured to moderate it, by giving at night an emulſion made with ſix or ſeven drams of *diacodium*; or twenty-five drops of the anodyne tincture, in a ſpoonful of water; or five grains of the pills of hounds-tongue; which may be uſed in all caſes.

II. To theſe internal medicines, ſhould be joined, the topical remedies applied on the breaſt of the patient; of which, I ſhall content myſelf with propoſing the moſt uſeful.

1° Embrocations ſhould be made, with oil of roſes or of ſweet almonds; and, over them ſhould be applied anodyne, and emollient, cataplaſms, made with the pulp of the leaves of lettuce, purſlain, and even tobacco baked under aſhes; to which ſhould be added a little oil of roſes; or what is ſtill better, a cataplaſm made with the crumb of white bread and milk; in which ſhould be put, the yolk of an egg: there ſhould alſo be employed the cooling cerate of Galen, ſpread on a cloth. Theſe cataplaſms ſhould not be left on till they grow dry; but, be renewed often; obſerving always to apply them warm.

2° If, by the uſe of theſe remedies, a cure be obtained, or a conſiderable diminution of the fever, and a ſenſible relaxation procured in the breaſt, which appears to ſhew a beginning of the reſolution; the patient ſhould be given, to aid it, every day ſeveral cups of tea, or even an infuſion of *veronica* or fluellin, and a cataplaſm ſhould be applied, with the reſolvent powders, boiled in a decoction of the leaves of mint, or panada made of wine; or of the leaves of red coleworts, macerated over the fire, ſtript of their thick coats, and rubbed with honey, or a cloth ſpread over with honey; or a cataplaſm made with the pulp of the leaves of red colewort, baked on the cinders, with which ſhould be mixt a little oil of camomile.

3° Care

3° Care ſhould be taken, though ſeveral authors have adviſed it, not to employ aſtringents; as the cimolean earth; or to ſpeak more properly, the ſediment which is found at the bottom of a cutler's trough: nor repellents; ſuch as vinegar, oxycrate, oxymel, &c. becauſe theſe remedies concrete the milk in the breaſts, which cauſe hardneſſes or knots in them.

4° It is an important queſtion, whether it be proper to have the breaſts drawn of lying-in women, and thoſe who give ſuck and have an inflammation of the breaſts: with regard to which phyſicians are divided in their opinion. It is certain, the diſeaſed breaſt ſhould not be ſucked. For, beſides that nothing would be drawn from it, becauſe of the tenſion and obſtruction, the pain that would reſult from it would augment the diſeaſe. But the moſt general advice that can be given is, that the ſound breaſt may and ought to be ſuckt and emptied, if practicable, two or three times a day. The milk, that is carried into the diſeaſed breaſt, will, by this means, be turned another way, and the tenſion and obſtruction diminiſhed. But for this operation no dependence muſt be had on the child; and it is neceſſary to employ a girl of ten or twelve years old who can ſuck ſtrongly: or otherwiſe to have it performed by the method directed in the preceding chapter.

5° It ſhould, therefore, be well underſtood, that the women who give ſuck, and have an inflammation of the breaſts, cannot nurſe their children. They muſt be given to a woman who can ſuckle them, if they be young: or weaned if they be old enough. This is a matter that ſhould be determined ſpeedily, ſo that the child may not ſuffer by delay.

In common inflammations there are ſymptoms of approaching reſolution on the ſixteenth or ſeventeenth day. This does not happen ſo ſoon in the inflammation of the breaſts, becauſe the milk is an humour not ſo eaſily diſſolved; and patience muſt be generally had even to the nineteenth or twentieth day. If the fever and

other

other accidents continue then, and go on augmenting, there is reaſon to hope, that the diſeaſe will terminate happily by the way of reſolution. But, if after an apparent reſolution of ſome days ſtanding, the fever and other accidents be renewed, it need not be doubted, but that the tumour begins to ſuppurate, and tends to produce an abſceſs, which demands a new and very different method of treatment: as will be ſeen in the following chapter.

## CHAP. IV.

### *Of the abſceſs or apoſtem of the breaſts.*

#### DESCRIPTION and DIFFERENCE.

AN abſceſs or *apoſtem* of the breaſts, is a tumour full of *pus*, or a fluid which approaches very much to the nature of it.

This tumour comes in conſequence of the milky obſtruction, which happens in the *coloſtrum*; or in the obſtruction in the phlegmonic inflammation of the breaſts. For as to tuberculous abſceſſes, I do not believe, that they ever take place in the breaſts.

When the milky or phlegmonic obſtructious, inſtead of being diſperſed by way of reſolution, change to an abſceſs, all the accidents, that the patient has gone through, in the height of the diſeaſe, are renewed: that is to ſay, the tenſion, pain, heat, and redneſs, with oftentimes a very ſenſible pulſation. By theſe ſigns it is known when an abſceſs may be deemed *abſceſſus fiens*. In a few days the calm returns; and it is thence judged the abſceſs is become *abſceſſus factus*.

Sometimes the obſtructions, that have preceded an abſceſs, have many knots or kernels; in each of which

which a particular ſuppuration, and conſequently a diſtinct abſceſs, is formed : and there are, therefore, in the ſame breaſt, ſeveral ſeparate abſceſſes. Sometimes theſe obſtructions have only one knot, or kernel, and it forms there conſequently only one ſuppuration ; in which caſe there is only one abſceſs in the breaſt. It happens often alſo, that the ſmall ſeparate abſceſſes unite themſelves into one abſceſs, by burſting the partitions, which ſeparate them.

As far as I have been able to obſerve, an abſceſs of the breaſt may have three different ſeats ; ſometimes it is in the *ſtrata* of fat which are under the ſkin ; but this is very rare. Sometimes it is in ſeveral knots of the mammary glands, ſeparated from the body of the breaſt as deſcribed in chap. I. And ſometimes it has its ſeat in the body of the breaſt ; but at the extremity of it. For it is very rare, that this part is affected entirely ; and I have never obſerved it. The firſt kind of abſceſs is a ſuperficial and cutaneous abſceſs. The two others, are more profound.

The worſt abſceſs is that which is formed under the nipple, becauſe it is very painful ; occaſions a conſiderable ſwelling in the whole breaſt ; generally cauſes the ſinking in of the nipple ; and often makes it fall off.

It has been ſaid before, that the matter contained in the abſceſs of the breaſts was *pus*, or a fluid which approached to the nature of it ; but this depends on the nature of the obſtruction, that has given riſe to the abſceſs. If this obſtruction be purely phlegmonic, which is very rare, the matter of the abſceſs is true *pus*. If the abſceſs be purely lactiferous, which happens ſometimes in the *coloſtrum*, the matter is only a colliquated milk, acrid and corrupted. Laſtly, if the obſtruction be partly milky, and partly phlegmonic, the matter will be *pus*, charged with much milk : and this is the moſt common caſe.

As

As long as the matter of the abſceſs remains ſhut up, without any paſſage to eſcape, the diſeaſe retains the name of abſceſs or apoſtem: which is the ſubject of this chapter. But if the matter makes an opening itſelf, by which it begins to diſcharge, or that, in conſequence of its flowneſs one is made for it, the diſeaſe then changes its name, and is called an *ulcer*, as will be ſeen in the following chapter.

## CAUSES.

We have treated of abſceſſes in general in the *Traité des tumeurs*, Book I. Chap. II. We have ſpoken in particular of abſceſſes of the *uterus* in this work, Book II. Chap. III. Both theſe places referred to may be conſulted, and particularly the firſt, by thoſe who deſire to know the manner, in which the blood, in inflammations, is converted into *pus*; which will ſerve to explain how, in obſtructions, which are at the ſame time milky, and phlegmonic, the matter that is then formed muſt be a milky *pus*; participating more of the one, or other quality, accordingly as the obſtruction is more milky or phlegmonic.

It will be ſufficient to remark, that, if, in the milky or phlegmonic obſtruction of the breaſts, the ſtrangulations of the veſſels, which have been produced by obſtructing the courſe of the milk or blood, be diſperſed by bleeding or applications made on the diſeaſed part; and, that, at the ſame time, the matter of theſe obſtructions be diluted enough, by the abundance of drink that has been ordered; or attenuated enough by the repeated oſcillations of the arteries, it will, by that means, be in a ſtate to be reabſorbed by the lymphatic veins, which come from the obſtructed part of the breaſts, and go to the extremities of the glands of the arm-pits, in which they depoſit it, in order to paſs from thence into the blood. It is in this manner, that the reſolution of the obſtructions

ſtructions of the breaſts is made. For the pain which the patient feels then, in the glands of the arm-pits leaves no doubt, but that it is from thence the reſolution is made.

But if one of theſe two cauſes be wanting, that is to ſay, if the ſtrangulations of the veſſels, which have given riſe to the obſtructions, continue obſtinately; or, that the matter of the obſtructions cannot be diluted, or attenuated enough to be abſorbed; in both caſes, this matter, beaten by the repeated and even augmented oſcillations of the arteries, will change its nature; and be converted into a milky purulent matter; ſuch as that, which is contained in the abſceſs of the breaſts.

In truly phlegmonic inflammations this change begins, the ſixteenth day, and is generally perfected the nineteenth. The ſame does not quickly happen in inflammatory obſtructions of the breaſts; becauſe the milk, which forms a large part of it, is not ſuſceptible of ſo ſpeedy a change. It is ſcarcely to be perceived till towards the ninth or tenth day, and ſometimes it is not perfected till the fifteenth. Things go on ſtill more ſlowly, when the obſtruction is purely, or almoſt purely milky; as in the *coloſtrum*.

When the matter of the obſtructions, in conſequence of being beaten and attenuated, by the oſcillations of the arteries, without being capable of being reſolved, comes to be diſſolved, and rarified, it compreſſes the blood-veſſels near it; augments their oſcillation, and conſequently renews the tenſion, pain, heat, and redneſs, which were abated. The irritation which this matter, colliquated and become more acrid, makes then on the nerves and fibres, ſtill augments theſe accidents; inſomuch, that the ſuppuration continues to go on; and the abſceſs to be formed.

But when this matter is colliquated, and the veſſels that encloſe it, and the fibres, that connect thoſe veſſels, have been broken or torn; it finds itſelf

ſelf at full liberty, and acts only on the neighbouring parts; in which caſe the circulation of the blood is re-eſtabliſhed. Likewiſe the tenſion, heat, redneſs and pain diminiſh; and even ceaſe. This is the fate of the abſceſs when already formed.

As this matter is generally acrid, in abſceſſes, it erodes by degrees the parts that contain it; and the eroſion is more or leſs ſtrong accordingly as the parts are more or leſs diſpoſed to ſuffer it. Hence comes the progreſs of thoſe abſceſſes, that are indeed real; but which, however, are not equally formed on all ſides.

The progreſs of abſceſſes of the breaſts, is always made very ſlowly: becauſe the matter, which is incloſed there, is thick, and cannot inſinuate itſelf deeply into the parts; and becauſe it is acrid only in a ſmall degree, and not very capable of eroding the parts into which it has inſinuated itſelf. From thence proceeds the ſlowneſs of the progreſs of abſceſſes of the breaſts; which are borne a long time, without being opened; and the thickneſs and denſity of the proper ſkin of the breaſts has a great ſhare in that conſequence. But this matter continually acting nevertheleſs makes its way gradually through that integument, and forms under it, one or more points, or eminences, that mark the place in which the matter is.

Laſtly, this matter opens one or ſeveral vents, greater or leſs; by which it oftentimes diſcharges itſelf copiouſly; and from which it ſometimes only oozes. Sometimes, likewiſe, when the matter is thick and milky, it is ſo ſlow in coming out, that it is neceſſary to have an opening made for it; particularly if the patient ſuffer by the delay. In both caſes, the abſceſs being opened, its name is changed, as has been ſaid; and it becomes an ulcer; of which we ſhall ſpeak in the following chapter.

SYMP-

## SYMPTOMS.

1° In abſceſſes of the breaſts, there is a great quantity of purulent matter, and the edges of them are ſwoln and tumefied; which proves, that the blood and lymph are ſtagnated in them. Therefore, in the caſes of ſuch abſceſſes, the breaſts muſt be heavier than ordinary; and this weight is ſometimes ſo great, that the breaſt muſt be ſupported by a large bandage, that ſhould ſurround it; and be faſtened to a kind of collar, ſuch as is worn by beggars, paſſed about the neck.

2° In all abſceſſes of the breaſts, there is a continual diſtenſion of the parts; either from the quantity or weight of the purulent matter contained in them. Therefore, in ſuch abſceſſes, the breaſts are never exempt from pain, though they are not always equally ſubject to the ſame degree.

3° When the ſuppuration is made, the purulent matter encloſed being more at large in the bag of the abſceſs, no longer ſwells the part, or compreſſes the blood-veſſels. Therefore, in abſceſſes of the breaſts, when they are formed, there is neither tenſion, redneſs, heat, or acute pain.

4° In abſceſſes of the breaſts when the matter is well colliquated and attenuated, a part muſt be reabſorbed by the lymphatic veins, and carried into the lymphatic glands of the arm-pit, of the ſame ſide, in which they terminate; and muſt tumefy thoſe glands. Therefore, in the abſceſſes of the breaſts, that are a long time before they open, the glands of the arm-pit of the diſeaſed ſide muſt be tumefied; and become painful.

5° The purulent matter of abſceſſes of the breaſts, that have been carried into the glands of the arm-pits, paſſes from thence into the blood by the roriferous veſſels of Bilſius, which depoſit it in the left ſubclavian; and, by its mixing there with blood,

produces a ſlight obſtruction by its acidity. When, therefore, abſceſſes of the breaſts continue a long time, the patient will often feel little ſhiverings, or ſlight *horripilations*.

6° It is a law of nature, which is too long to be explained here, but which is conſtant, that all the obſtructions, which happen in the blood, or which produce ſhiverings, are followed by a feveriſh diſpoſition, known by the quickneſs of the pulſe and augmentation of heat. Therefore, in abſceſſes of the breaſts, the ſhiverings which the patient feels, from time to time, are followed by little feveriſh paroxyſms, ſenſible in a greater or leſs degree; and more or leſs long.

7° Abſceſſes of the breaſts, which have their ſeat under the nipple, affect a very nervous part. Theſe abſceſſes muſt, therefore, be very painful.

8° In theſe abſceſſes, the lactiferous ducts muſt, by being dilated and tumefied, be ſhortened. They will, therefore, draw in the nipple, where they confine it.

9° In theſe abſceſſes, the lactiferous ducts, which are eroded and ſwim in the purulent matter, muſt be filled with it; and carry it out through the end of the nipple. Therefore in this caſe, the *pus* muſt be diſcharged by the nipple more or leſs copiouſly, according to the number of the lactiferous ducts lacerated.

10° Laſtly, if the *pus* of the abſceſs be ſo acrid, that all the lactiferous ducts, or almoſt all of them, be torn, the nipple, which has ſcarce any other connection with the breaſt, is often ſeparated; and falls off.

## DIAGNOSTIC.

I. Abſceſſes of the breaſts never happen, but in conſequence of the *coloſtrum*, or inflammations of them, when theſe diſeaſes are conſiderable; and do not

not terminate by way of reſolution. The caſes, therefore, in which abſceſſes are to be feared, are very obvious.

II. Abſceſſes never happen in theſe diſeaſes; but when, after a deceptive remiſſion, all the accidents; that is, the tenſion, redneſs, heat, pain, and even the fever; which are abated, return again without any other cauſe. They muſt therefore be known, the moment the abſceſs begins to be formed.

III. If theſe accidents ceaſe in a few days, and in ceaſing leave the breaſt ſwelled, it may be aſſured, that the abſceſs is formed; but it is ſtill more certain, when there is found in the breaſt a tumour which appears to be full of fluid matter, by the fluctuation that is perceived there, on preſſing gently the two oppoſite ſides.

IV. There is reaſon to believe, that the abſceſs is more milky than purulent, when it happens from the *coloſtrum*, or an inflammation, which was rather milky than phlegmonous.

V. It may be judged, whether there be one abſceſs, or ſeveral, by feeling whether different bags or cyſts can be diſtinguiſhed; or one only.

VI. It may be known, whether the abſceſs be ſuperficial or deep, not only by the pain that the patient feels more profoundly or ſuperficially: but ſtill better, by the fluctuation of the purulent matter, according as it is felt more or leſs internally.

VII. Laſtly, the abſceſs, which is under the nipple, may be eaſily known, by the ſeat of the pain and tumour, and the ſymptoms that are peculiar to it; ſuch as the ſinking in of the nipple; and the diſcharge of *pus* at the end of it.

## PROGNOSTIC.

I. Abſceſſes of the breaſts are a long and painful diſeaſe, long in forming, and long in curing.

II. Abſceſſes of the breaſts often leave indurations of the glands, when ſome of the obſtructed part remains unſuppurated.

III. Abſceſſes of the breaſts, particularly when they are large and deep, leave a cavity, which forms a diſagreeable hollow when the diſeaſe is cured.

IV. Abſceſſes of the breaſts, that are ſituated under the nipple, often erode the baſe of the end of the pap; and make it fall off; which, with regard to giving ſuck, renders that breaſt uſeleſs.

V. Deep abſceſſes are more difficult to cure than ſuch as are ſuperficial; and purulent abſceſſes more than thoſe that are milky.

VI. Laſtly, abſceſſes of the breaſts are always dangerous, and long in curing, when they attack the body of the breaſt.

## METHOD OF CURE.

Abſceſſes of the breaſts fall under treatment in two different circumſtances.

I. When they are formed. In which caſe, great attention ſhould be employed to diminiſh the accidents, particularly the pain, and fever, ſuppoſing them to happen. For this reaſon, 1° There ſhould be applied, on the diſeaſed breaſt, anodyne cataplaſms, ſuch as thoſe made of the crumb of white bread and milk, to which at laſt ſhould be added honey; or of rice boiled in milk; in which alſo honey ſhould be put. Theſe cataplaſms muſt not be left to dry on the part; but care ſhould be taken to renew them properly.

2° It would be well, before they be applied, to make a ſlight embrocation with warm oil of ſweet almonds, with which ſhould be mixt a little oil of eggs, or ſheep's feet; or of camomile; accordingly as the degree of tenſion is greater or leſs.

3° If the pain and tenſion be very conſiderable, and a fever be found joined to them, no heſitation ſhould

ſhould be made to bleed the patient once or even twice: and I believe, it would be beſt to do it on the ſound ſide.

4° The patient ſhould forbear to give ſuck to her child. Nevertheleſs, if the ſound breaſt be very full of milk, it ſhould be drawn once or twice a day, by a perſon who is uſed to do it: or the means heretofore propoſed ſhould be employed as a ſubſtitute.

5° In the mean time, to favour the diſcharge of the milk, ſhould be given many clyſters, ſimple or purgative; and plenty of ptiſan and ſlight diuretics; as infuſion of capillaire, decoction of dogs-tooth, or roots of *calamus aromaticus*. The patient ſhould be made to take apozems, with the leaves of chervil, pimpernel, and rupture-wort; to which ſhould be added one dram of *ſal de duobus*.

6° There ſhould be applied on the diſeaſed breaſt, a cataplaſm made with the pulp of a red cabbage, boiled in water: to which, after having paſſed it through a ſieve, ſhould be added, oil of camomile, and honey.

7° If the pain be violent, means ſhould be uſed to moderate it, at leaſt during the night, by giving then ſome doſes of a ſedative; as five drams of ſyrup of *diacodium*, twenty or twenty-four drops of anodyne tincture, or five grains of hounds-tongue pills.

8° Laſtly, the diet of the patient ſhould be regulated accordingly to the ſtate ſhe is in. If the tenſion, pain, and redneſs be very conſiderable; and eſpecially, if there be any fever; the patient ſhould be kept to broth, which is always ſafeſt. There may, however, be allowed them, ſome ſpoonfuls of creed rice, or the yolk of an egg in their broth, when the ſuppuration is perceived to be nearly completed, which is ſhewn by the abatement of the ſymptoms.

II. Then 1° ſuppurating or maturative cataplaſms ſhould be employed, to forward the ſuppuration, and render it equal in the whole of the diſeaſed part. Theſe cataplaſms ſhould be made with the pulp of the leaves of mallows, marſh-mallows, brank-urſine, and lily roots baked on the aſhes; to which ſhould be put ſome freſh made *baſilicum*. There might be added, to render it more efficacious, if it be thought neceſſary, bruiſed ſnails or old yeaſt.

2° If the abſceſs begin to ſhew any point, which indicates that it tends to open there; and a ſtronger fluctuation be felt in the place; there ſhould be applied a pledget ſpread with *baſilicum*, to bring forwards the ſuppuration; the pledget being afterwards covered with a cataplaſm.

3° The uſe of clyſters and apozems ſhould moreover be continued. The patient ſhould be exhorted to perſevere in the uſe of the ſame ptiſans; and ſhe ſhould be allowed a little ſtronger nouriſhment, particularly if the abſceſs be not very conſiderable.

4° By continuing the uſe of theſe remedies, they ſoon render the ſoftneſs uniform in all the tumour; and as this is a ſure mark, that the ſuppuration is completed, it is time to open the abſceſs, in order to diſcharge the *pus*: at leaſt if it be no way ready to open itſelf. As this now forms a new kind of diſeaſe; a new method of treatment muſt be employed; as will be ſhewn in the following chapter.

CHAP.

# CHAP. V.

## *Of the ulcer of the breasts.*

### DESCRIPTION.

THE *ulcer* of the breasts is a solution of continuity, in the substance of the breasts, from which flows a *pus*, or at least, a matter which approaches to the nature of *pus*; whence it is easy to comprehend, that all abscesses of the breasts, when they are opened, must bear the name of ulcers of the breasts.

Ulcers of the breasts, just as all other ulcers, are at the beginning full of jagged spots, greyish, brown, or blackish: or in other words foul and sordid. Gradually, by the applications of remedies, and even by simple dressing, they become red, and without jagged spots: or in other words they are *deterged*; which is a previous disposition to healing.

The other differences of the ulcers depend on the nature of the abscesses. They are superficial or deep, if the abscesses be superficial or deep. They are simple or compound, if the abscesses be so themselves. Lastly, there is a multiplicity of them, if there be many distinct abscesses.

### CAUSES.

The ulcers of the breasts are always the consequence of abscesses of those parts; and, therefore, the causes of ulcers of the breasts, are the same as those of abscesses of the breasts; which we have sufficiently explained before. It is true, that a wound of the breast, when it begins to suppurate, merits the name of ulcer, in speaking strictly: which would make another kind of ulcer of the breasts;

but it is an eſtabliſhed uſage to call theſe ulcers wounds, even to their perfect cure: and were not this an eſtabliſhed uſage, ſuch kind of ulcer requires the treatment of wounds; and does not belong to the ſubject of this work.

We ſhall therefore ſay nothing on the cauſes of ulcers of the breaſts. It is ſufficient to remark;

1° That the matter which comes out of the abſceſs, when it is opened, is compoſed of blood, lymph, and milk, retained by the obſtruction; and converted into *pus*: and the capillary, blood, lymphatic, and milky veſſels, as well as the nerves, and tendinous fibres, diſſolve in this *pus*; or are divided into little threads, which float in it.

2° That after the coming out of this *pus*, the ſurface of the abſceſs or ulcer is rough, with a great number of jags of the ſame nature, half corrupted at one end; and adhering, at the other, to the other part of the ſame veſſels or ſame fibres; between which jags, there are ſeveral flakes of *pus*, thick, and cohering with each other.

3° That in this ſtate, the face of the ulcer is grey, brown, or black of different ſhades; and full of jags that adhere to it: which makes it appear very foul. In this ſtate, the ulcer bears the name of a *foul* or *ſordid ulcer*.

4° That, gradually, the parts of theſe jags, which hang in the ulcer, putrify intirely by the application of remedies, ſeparating themſelves, and dragging with them the *pus* that was retained there: and by this means the fleſh begins to appear of the colour of vermilion, which is an introduction to the cure. In this ſtate the ulcer bears the name of a *deterged ulcer*.

## SYMPTOMS.

1° The firſt days, after the opening of the abſceſs, the *pus* diſcharged by the ulcer, is very copious;

pious; becauſe the ſurrounding parts, which were full of blood, lymph, and milk, diſembogue themſelve: and moreover the half putrified jags, and the *pus* which they abſorb, which detach themſelves from the ſurface of the ulcer, muſt augment the quantity of it. It muſt be allowed, indeed, that they contribute to render it, at the ſame time, more fetid, thick, and unequal.

2° In proportion as the ulcer is deterged, it furniſhes leſs *pus*, and what is furniſhed, becomes more fluid, equal, and inodorous: becauſe only a part of the lymph or milk is diſcharged from the lymphatic or lactiferous veſſels, not yet quite cloſed, and grows a little thick in the cavity of the ulcer, from one dreſſing to another.

3° The ulcer at laſt furniſhes ſcarcely any more *pus*: becauſe the neighbouring veſſels, in which all the capillary ramifications have had time to contract, ſuffer nothing to eſcape into its cavities; and exude nothing but a lymphatic *ſerum*, which moiſtens it.

4° The cavity of the ulcer is then found to be conſiderably diminiſhed, by the contraction of the ſurrounding parts: the fleſh begins to grow on all ſides, and to fill up the ulcer: and the cure may be expected to be near. But whatever ſucceſs it may be attended with, it is not to be expected that the *cicatrix* will be even with the ſkin around it. The diſeaſed place will always remain ſunk, more or leſs, according as the ulcer was deeper or more ſuperficial; and its cavity more or leſs large.

5° When the ulcer is deep, and the *pus* acrid, the patient is ſenſible very often, in the glands of the arm-pit, of the ſame ſide, of pain and heat; becauſe the *pus*, which is carried into the glands, by the lymphatic veins, excite there this ſenſibility. But, in general, nothing is felt in theſe glands, when the ulcer is ſmall; and the *pus* without acrimony.

6° As

6° As the ſubſtance of the breaſt is ſpongy, the fleſh which is there formed, is ſubject to be dilated and rarified. If it be ever ſo little neglected, proud fleſh, and even ſometimes funguſſes are formed, which retard the cure.

## DIAGNOSTIC.

Every thing is perceptible in the ulcer of the breaſts, its exiſtence, ſituation, magnitude, and quality; whether the *pus* it furniſhes be acrid, or ſweet; ſerous or thick; and whether there be only one ulcer or ſeveral.

## PROGNOSTIC.

The prognoſtic is not more difficult. The ulcer of the breaſts is a diſeaſe of long duration, troubleſome and bad; but rarely dangerous; eſpecially if not large; but ſuperficial, cauſed by milk, and in healthy women, in whom there is no reaſon to ſuſpect a venereal, ſcorbutic, or ſcrophulous taint. So favourable a judgment muſt not be given in the contrary caſes.

An ulcer, which is under the pap, or near it, requires particular attention; as well becauſe it is very painful, as becauſe it occaſions generally, the falling off of the nipple; which deprives the patient of the means of giving ſuck on that ſide.

## METHOD OF CURE.

It is a rule, that, as ſoon as the abſceſs of the breaſts is perfectly ſuppurated, no hardneſs remains, and the circumference is ſoftened, it muſt be opened to evacuate the matter, and hinder the eroſion of the neighbouring parts; which ſhould be done in the moſt depending part, that the matter may be diſcharged with greater facility.

The only doubt that has ariſen is, whether the opening ſhould be made with the actual or potential

tial cautery; or with the lancet or biſtory. This doubt appears of ſo little importance, that it may be left to the deciſion of the patients, or their ſurgeon. I am ſenſible, nevertheleſs, there is at preſent a diſpoſition to prefer the biſtory, and I know no reaſon againſt it.

The opening being made, and the matter ſuffered to be diſcharged, the body of the breaſt ſhould be gently preſſed; and the ulcer dreſſed afterwards with ſoft pledgets, ſpread with freſh digeſtive; to which ſhould be added oil of eggs, newly extracted; or the yolk of an egg. Some days after, when the ulcer begins to be deterged, there ſhould be added to the digeſtive the liniment of *Arceus*: or even this liniment may be employed alone; unleſs fungous fleſh ſhould appear; and make it neceſſary to add the green balſam, or a little *mel Egyptiacum*, or even the brown balſam; but in ſmall quantities.

Laſtly, when the ulcer ſhall be filled up, and nothing remains, but to procure a *cicatrix*, the part ſhould be dreſſed with dry lint, ſprinkled with boiling turpentine powdered, or burnt alum pulverized; or the *lapis infernalis* ſlightly paſſed over it.

This practice, though very methodical, admits, nevertheleſs, of many objections. It is pretended, that if the opening be made too large, and give too free an acceſs to the air, it acts on the interior ſurface of the ulcer; and thickens, conſequently, the fluids circulating there; which retards the cure. It is maintained, that theſe openings, by injuring the tendinous covering of the breaſts, even though it be thin, corrugates it, and produces callous, hard, unequal, and very diſagreeable *cicatrices*.

But the great objection, is, the repugnance women have to undergo the operation, however ſlight it be. They will abſolutely take it under their own care; or commit themſelves to the hands of women, who have before been in the ſame circumſtances. I have ſeen it often attended with great ſucceſs. The method

thod is indeed tedious; but the *cicatrix*, which covers the ulcer, is, by this means, rendered ſmooth, equal, and very little viſible.

1° They wait till the abſceſs opens of itſelf, but this is very ſlowly; becauſe it never happens till the ſkin of the breaſt be conſumed, and made thin: which prevents its turning back and ſhrinking, ſo as to make a corded *cicatrix*.

2° In the mean time, ſuppurating cataplaſms are continued to be employed, or cataplaſms of rice, boiled with milk, with which ſhould be mixt *Narbonne* honey.

3° When the opening is made, the breaſt is preſt gently, and the part dreſt with ſoft pledgets, ſpread with *baſilicum*, or more frequently with honey, with which ſhould be mixed the yolk of an egg.

4° If the opening be too little, which often happens, it is dilated by putting into it a tent, charged with the ſame medicaments; or by procuring a little prepared ſponge, to be employed in the ſame way.

5° This method is purſued for one or two months without any impatience, covering the dreſſings always with a plaſter of the unguent of *La Maire*: and the whole with a leaf or two of red cabbage, withered, and ſpread over with honey.

After the ſucceſs I have ſeen from this practice, I believe it may be confided in, eſpecially, if the ulcers be moderate and not large.

In whatever manner theſe ulcers are treated, the patient ſhould be exhorted to obſerve a proper regimen, and moreover to abſtain from diet that would retard the cure; as ſallads, bacon, cheeſe, &c. They ſhould moreover be purged at the middle and end of the treatment with follicles of ſena, the vegetable ſalt, and manna.

As to the falling off of the nipple, we ſhall ſhew hereafter what ſhould be done to remedy it, in the laſt chapter, in which mention will be made of the diſeaſes of that part.

CHAP.

# CHAP. VI.

## *Of the ſchirrhous knots, and ſchirrhuſſes of the breaſts.*

### DESCRIPTION.

I. THE ſcirrhous knots of the breaſts are true glandulous bodies, diſperſed in different places of the breaſt; unequally large, from the ſize of a grain of coriander ſeed, or a pea, to the magnitude of an egg, and even beyond it; of different figure, round, circular or oval; in form of almonds; without any particular ſhape; and moveable: there is frequently only one or two; but ſometimes ſeveral. Theſe knots were originally glands diſperſed in the adipoſe membrane of the breaſts, as has been ſaid in *Chapter* I. of this *Book*.

Notwithſtanding the apparent reſemblance of theſe knots to each other, there may be obſerved ſeveral important differences betwixt them, when they are examined with attention.

1° Some are ſmooth and equal, with obtuſe angles; the other are unequal, with acute angles.

2° Some are ſoft, though with a degree of reſiſtance; nearly as the glands which are naturally in different places. The others are wholly hard; and truly ſchirrhous.

3° Some are indolent. In others is felt a dull pain and often ſhooting; that is to ſay, acute, ſudden, and momentary pains; as if they were pricked with a pin.

4° Laſtly, ſome are fixt and permanent, remaining in the ſame ſtate, and keeping the ſame form and magnitude. Others increaſe; change their form and figure; and preſent new angles.

II. The

II. The *ſchirrhus* of the breaſts is a tumour of a large magnitude; hard, reſiſting, and indolent: ſometimes very ſmooth and even; at other times, unequal and angular.

The *ſchirrhus* is called *perfect*, when it is as hard as a flint; and the patient feels no pain, though it be preſt. It is named *imperfect*, if it be leſs hard, and they feel pain, on a ſlight compreſſion of it.

Sometimes this *ſchirrhus* remains a long time under the ſame form, without encreaſing, and without the patient feeling there either pain or ſhootings: in which caſe it preſerves the nature, and character proper to itſelf.

But ſometimes it even encreaſes without any apparent cauſe; changes its form; and becomes angular, painful, and, from time to time, ſhooting: in which caſe it tends to change its nature, and degenerate into a cancer.

As ſchirrhous knots are made by the induration of the glands, diſperſed around the body of the breaſt, in the adipoſe membrane, as we have remarked; ſo is the *ſchirrhus* of the breaſts, the ſame body, hardened; ſometimes throughout the whole; and then the *ſchirrhus* is *total:* at other times in one part only, and then the *ſchirrhus* is *partial:* but it then ſoon becomes total, becauſe the induration which extends itſelf, ſoon ſpreads itſelf throughout the whole.

## CAUSES.

I. We have remarked before, that, after the ſuppreſſing the milk; after the *coloſtrum*; and after the inflammation and abſceſſes of the breaſts; there remains often ſeveral knots of the mammary *veſiculæ*, full of milk, which do not reſolve, nor come to ſuppuration. Theſe are, as we have ſeen, ſo many cauſes of the ſchirrhous knots; which are the ſubject of this chapter.

But

But ſome others muſt be conjoined with them. 1° A blow on the breaſt, which, by bruiſing ſome knot of the mammary *veſiculæ*, deſtroys its elaſticity, and occaſions the milk to thicken and ſtagnate.

2° A too ſtrong compreſſion of any part of the breaſts, by an ill made pair of ſtays; a buſk too ſtiff; or by any thing hard carried in the boſom, which will produce nearly the ſame effect as a blow.

3° Their readineſs to allow their breaſts to be felt and handled, which expoſes them to compreſſions and bruiſes, that weaken the elaſticity of ſome of the knots of the mammary *veſiculæ*, and diſpoſes them to be obſtructed.

4° The ſuppreſſion of the *menſes*, or the ſudden ceſſation of an uterine hæmorrhage; becauſe the milk, which ſhould be diſcharged with the *menſes*, or with the flooding, being not diſcharged, flows back to the breaſts, and produces there a repletion of the *veſiculæ*.

5° Laſtly, an abſolute obſtruction of the *menſes*; by which, the uterine milk, being not diſcharged into the *uterus*, mixes with the milk of the breaſts, and produces an obſtruction of the knots, which are then more diſpoſed to it. This cauſe merits much attention; as it is very common: nothing being more frequent than to ſee in women, who are irregular in their *menſes*, knots form in the breaſt; or ſuch as were before there, without any inconvenience, become painful and large.

II. As the nature of a *ſchirrhus* of the breaſts is the ſame with that of ſchirrhous knots, the cauſes which produce theſe knots, and which we have explained, may likewiſe produce *ſchirrhuſſes*, and often do ſo. All the difference is, that the mammary body, which is the ſeat of the *ſchirrhus*, being deeper in the breaſts, and ſurrounded with much fat, is conſequently leſs expoſed to the action of external cauſes,

cauſes: which is the occaſion of a *ſchirrhus* being more rare than ſchirrhous knots.

## SYMPTOMS.

I. All the knots of the breaſt are produced by the milk, which ſtagnates in ſome of the compages of the mammary *veſiculæ*; and is there thickened; but it does not thicken equally in all. We have ſeen in the deſcription, that there are knots which are ſmooth, moderately hard, and indolent; and ſuch as retain their ſize. It is evident, that in theſe knots, the milk ſtagnates, becauſe it ſwells them. But it is apparent that it is neither compreſſed, nor coagulated, and, perhaps, even it preſerves the courſe of the natural circulation: that is to ſay, it paſſes with the milk of theſe glands into the lymphatic veins, which carry it into the glands of the arm-pits; as they receive it from the blood by way of ſecretion.

In this caſe, 1° The knots are formed, becauſe the milk, being too thick, ſtagnates in ſome of the compages of the mammary *veſiculæ*, and augments the volume of them.

2° But they do not encreaſe; as the milk not accumulating in them, goes out on one ſide, as ſoon as it has entered the other.

3° They are ſmooth and even, becauſe the milk, which ſtagnates in a moderate degree, ſwells them in an uniform manner.

4° They are not very hard; becauſe the milk only ſwells them in a certain degree; and therefore only cauſes a moderate reſiſtance.

5° Laſtly, they are indolent; becauſe the milk does not produce a diſtenſion capable of making an impreſſion on the nerves, which are diſperſed there.

II. There are other knots which are hard, ſchirrhous, unequal, and angular; which grow, and enlarge every day, in changing their figure: and which are painful, and even ſubject often to ſhort, but acute ſhootings.

ſhootings. In theſe glands, the ſtagnated milk is ſtrongly compreſt, and greatly accumulated; becauſe there is a continual acceſſion of new milk, and none going out again: the way of the lymphatic veins, which ſhould carry it to the arm-pits, being no longer free.

In this caſe, 1° Theſe glands will continue to encreaſe: becauſe the continual acceſſion of milk, that does not go out again, will ſwell them more and more.

2° They are hard and ſchirrhous; becauſe the *veſiculæ* being obſtructed with milk, as much as they can be, reſiſt all preſſure.

3° They are unequal and angular; becauſe the *veſiculæ* not having the ſame elaſticity in every part, yield unequally to the tumefaction, which the milk occaſions; and produce eminences, points, and irregular angles.

4° They change their form as they increaſe; becauſe the action of the milk that ſwells them, does not affect them in an uniform manner. Whereas the reſiſtance of the parts of the gland oppoſed to it, is not equal in every direction.

5° They are painful; becauſe the ſwelling, occaſioned by part of the milk, diſtends the nerves ſtrongly enough, to be a cauſe of the pain. Sometimes even this diſtenſion is ſo conſiderable, as to excite a quick and ſudden pain, known by the name of a *twitching* or *ſhooting pain*.

III. Such is the common ſtate of theſe two kinds of knots. But it will become worſe, if ſuch things be applied to the boſom, as will heat and rarefy the retained milk: if the patient do not obſerve a good regimen; but eat ſaline things, and ſpices of a hot taſte; drink wine, ſpirituous liquors, and coffee; ſtudy much; or give way to grief; and, laſtly, if a fever come on. In all theſe caſes, the diſeaſe will grow worſe. The knots of the firſt kind will acquire all the bad qualities of the ſecond; becauſe the obſtruction of the milk will be complete;

and, as its paſſage into the lymphatic veins will be intercepted, it will become alſo ſchirrhous, unequal, angular, painful, and increaſe from day to day, changing its form and figure.

The knots of the ſecond kind grow worſe, alſo, from the ſame reaſon: becauſe the milk is accumulated more abundantly; and, what is ſtill more to be dreaded, it will open and extend itſelf; which will make theſe knots become true cancers; as will be ſeen in the following chapter.

In order to comprehend what I ſhall only intimate here of the change of the compreſt and accumulated milk, in the knots of the ſecond kind, to which I attribute the generation of a cancer; I recommend the *ſecond* Chapter of the *fourth* Book of the *Traité des Tumeurs*, to be conſulted attentively; as I have there amply diſcuſſed this matter.

IV. All that has been ſaid here, with regard to ſchirrhous knots of the breaſts, and of their ſucceſſive progreſſions, holds good of the *ſchirrhus*, which has its ſeat in the mammary body.

Sometimes there is only an imperfect *ſchirrhus*, that retains its ſoftneſs and ſenſation, without giving any pain; which ſtate often continues all the life of the patient.

Sometimes the *ſchirrhus* becomes hard, reſiſting, and indolent, though compreſſed: in a word, it becomes a perfect *ſchirrhus*; but does not grow much, nor change its form; and it may be then borne without ſuffering much.

Laſtly, by continually growing worſe, the *ſchirrhus* changes its form, enlarges, becomes painful, and even ſhooting; and then it is not long in being converted into a cancer.

Theſe ſucceſſive changes happen to ſchirrhuſſes, from the ſame reaſons as to ſchirrhous knots: and, conſequently, all that has been ſaid of knots, may be applied to a *ſchirrhus*.

DIAG-

## DIAGNOSTIC.

I. Every thing is clear in the diagnoſtic of the knots of the breaſts. They may be perceived by the touch. It may be known whether they be ſmooth or ſoft; or unequal or angular. The place they occupy, and their volume, may be judged of. It may be felt if they preſerve any ſoftneſs; or if they be reſiſting and ſchirrhous. By examining them ſeveral times ſucceſſively, it may be known, whether they will remain in the ſame ſtate without increaſing, or if their figure and form will be changed by enlarging. Laſtly, the patient may give information if they be painful or not, and if the pain be ſhooting.

As to the cauſes that have given riſe to the diſorder, the patient may give information of it, from queſtions put to her: but this information ſignifies but little, either to the prognoſtic, or treatment of the diſeaſe.

II. If attention be given to the deſcription of the *ſchirrhus* in general, and the characters which are eſſential to it, the exiſtence of a *ſchirrhus* of the breaſts, its different ſpecies and various ſtates are eaſily known. The cauſes may even be diſtinguiſhed; though that knowledge influences but little, either in the prognoſtic or treatment.

I have ſeen, however, more than once, lacteous tumours of the breaſts taken for ſchirrhuſſes; ſuch as thoſe which happen to lying-in women, who ſuppreſs their milk, or to thoſe women that give ſuck, who have the *coloſtrum*; or who imprudently ceaſe to give ſuck, without any precaution, in the greateſt abundance of their milk. However, theſe tumours are very different from a *ſchirrhus*. They are much leſs reſiſting, and not ſo well circumſcribed. They are not without pain when preſt, but no ſhooting pain is felt. They are often accompanied with fever. Laſtly, they come to ſuppuration, which removes all doubt.

In theſe tumours, as ſoon as the fluctuation is perceived, and even before, if the nature of the pain be well aſcertained, maturative cataplaſms, and the other remedies propoſed in the two laſt chapters, may be uſed; and, by this means, a perfect cure will be attained.

When ſuch caſes come before ignorant perſons, who know not the diſtinction of theſe diſeaſes, they imagine themſelves to have cured a cancer; have the weakneſs to boaſt of it; and regard, as a valuable ſecret, ſome common remedy, which they have employed. It has a long time been ſaid, *That it is the ignorant perſons only who perform miracles in phyſic.*

## PROGNOSTIC.

I. Knots in the breaſt are always a diſeaſe; and the moſt gentle give inquietude, from the bad changes which may happen to them.

II. The ſmooth knots, that retain the ſame form and figure without encreaſing; that are not perfectly hard; and without pain; are the leaſt bad of any: but they are not without ſome danger. Sometimes they go away, and are diſperſed, by the way of reſolution. Sometimes, without diſperſing, they remain in the ſame ſtate, without augmenting. Sometimes, alſo, they encreaſe, change their figure and form, and become painful and ſhooting; but this never happens, unleſs when diſſolvent plaſters are applied, which over-heat them; when diſſolvent medicines are imprudently uſed; when the patient receives a blow which bruiſes the part; when the breaſt is often handled; when the *menſes* are ſtopt or ſuppreſſed; when a fever happens to come from any cauſe; and, laſtly, when the patient falls into a bad regimen.

III. The knots, which enlarge by changing their form; and which are ſchirrhous, painful, and ſhooting; are very bad. The cure of them ſhould not be

be hoped for; becauſe they are ſo difficult to be reſolved or ſuppurated. All that is done ſhould be confined to the uſe of palliatives; which may indeed retard the progreſs of the diſeaſe; but cannot hinder it from augmenting, even ſo as to render the knots cancerous. The only means of remedy is to extirpate it: but this is not to be done without difficulty.

IV. Other things being alike, the little ſuperficial knots, pretty well detached, are more eaſy to be extirpated than the large, deep knots, which adhere to the mammary body, that forms the breaſt; and are, conſequently, leſs ſuſceptible of cure, if they are ſubjected to this operation.

V. Knots in the breaſts, in healthy women, who are of a good conſtitution; whoſe *menſes* are regular; whoſe blood is pure and ſweet; and who obſerve a good regimen, and drink water; are leſs dangerous, and even more eaſy to be cured, than the ſame in women full of humours; whoſe *menſes* are irregular; whoſe blood is acrid and viſcid, with a ſcorbutic, ſcrophulous, or venereal taint; who are irregular in their diet; and drink wine, ſpirituous liquors, or much coffee.

VI. The prognoſtics which we have laid down, as to ſchirrhous knots, hold good intirely as to the *ſchirrhus* of the breaſts. They are borne a long time without inconvenience, when the *ſchirrhus* is not perfect; ſometimes, even in this ſtate, they diſperſe, by an inſenſible reſolution; but long. A cure is not to be expected when the *ſchirrhus* is become perfect; and it is then to be feared every moment, that it will become cancerous. Finally, when the *ſchirrhus* has taken this laſt turn, neither a cure, nor relief is to be hoped for.

VII. It is proper, however, to mention, that a *ſchirrhus* is always more dangerous than ſchirrhous knots, becauſe it is more voluminous; becauſe it may come to adhere; which often happens to it; but never to the ſchirrhous knots: and, laſtly, be-

cauſe the extirpation of it, when undertaken, is more difficult and dangerous than that of the knots.

## METHOD OF CURE.

I. The ſchirrhous knots, and the *ſchirrhus* of the breaſts, depend originally on the ſame cauſes; and require the ſame remedies; that is to ſay, diluents, emollients, aperitives, and very gentle diſſolvents; which, by diluting the blood and the milk, that the blood furniſhes to the breaſts, may procure a reſolution of the milk, which is ſtopt in the glands, or in the mammary body; or at leaſt hinder its utmoſt concretion, without exciting any heat there, that may augment the expanſion of the obſtructed matter. Theſe remedies are often efficacious in the knots and more kindly ſchirrhuſſes; and are even palliative in the malignant. They are, however, the only remedies, that can, and ſhould be employed.

II. It is proper, in theſe diſeaſes, to avoid the uſe of topics, plaſters, cataplaſms, and embrocations, which are heating, diſſolvent, greaſy, unctuous, and therefore apt to rarefy the retained milk, aſſiſt the expanſibility of it, and augment the diſeaſe. The only topic I have ſeen uſed with ſucceſs, is a compreſs of worn linnen, folded in four doubles, and dipt in the patient's urine; or, in that of a young and healthy perſon; but the ſucceſs was but very moderate.

III. For the ſame reaſon, it is not proper to employ active emmenagogues, even if the diſeaſe ſhould come from a ſuppreſſion of the *menſes*; becauſe theſe remedies, by heating the blood, haſten the expanſion of the milk; and accelerate the progreſs of the diſeaſe.

IV. Greater care muſt ſtill be taken, not to employ mercurials or chalybeates; becauſe theſe remedies, being active, heat the blood; and much expand the thick

thick milk ; which obſtructs the glands. The ſame may be ſaid of decoctions, of the ſudorific woods, as guaiacum, ſaſſafras, china-root, and ſarſaparilla : which are all hurtful in the treatment of ſchirrhous glands, and ſchirrhuſſes.

V. However, if the patient be ſo unhappy as to have the venereal diſeaſe, ſcurvy, or *ſcrophula*, the employing proper remedies for the cure of them ſhould not be neglected : ſuch as mercurial unctions for the venereal diſeaſe, and anti-ſcorbutics, and anti-ſcrophulous remedies, to correct the ſcorbutic and ſcrophulous humours. But after a long preparation, by many bathings, and cooling broths, a very ſlight quantity of unction ſhould be uſed ; and from time to time, the patient ſhould take all the proper emollients. After ſuch a preparation ſhould be employed, if it be proper, anti-ſcorbutic and anti-ſcrophulous remedies : chuſing the moſt gentle ; and moderating the too great activity, by ſuitable means.

VI. After theſe general remarks, intended to aboliſh a practice, which, though common, is not leſs pernicious ; we believe that women, who have knots or a *ſchirrhus* in the breaſts, ſhould be treated in the following manner, authorized by the approbation of the moſt ſkilful phyſicians.

1° A ſtrict regimen ſhould be preſcribed, confined to ſoop, and fleſh boiled or roaſted : prohibiting fiſh, ſalt, ſpices, ragouts, pies, wine, ſpirituous liquors, coffee, ſitting up late, and too ſtrong exerciſes ; but exhorting the patient to keep her breaſt warm ; and to cover it againſt all external accidents ; never to touch it herſelf ; and not to let it be touched but when there is a great neceſſity.

2° The patient ſhould be let blood every month, or, at leaſt, every two months ; only taking every time five or ſix ounces of blood ; this is the moſt efficacious palliative.

3° The patient ſhould be purged every two months, with manna, rhubarb, and *ſal de duobus*. If

theſe purges be not ſtrong enough for the habit of the patient, there ſhould be added the follicles of ſena in infuſion, without joining any of the ſalts, but the *ſal de duobus*.

4° During winter, the patient ſhould take, in the morning, in bed, chicken or veal broth, in which ſhould be boiled, during the laſt quarter of an hour, the leaves of wild ſuccory, borrage, and water-creſſes, of each a handful. This broth ſhould be given at different times, during fifteen or twenty days each time: and the patient ſhould take, immediately before the broth, a bolus compoſed of ſeven grains of gum *ammoniacum*, and ſeven grains of the extract of the *elixir proprietatis* of Paracelſus.

5° In the ſpring, the patients ſhould take whey, made with preſſure, and filtered, to prepare them for milk. They ſhould even immediately have recourſe to milk, if the ſtomach be well enough prepared to digeſt it. Aſſes milk is the beſt for that purpoſe: they ſhould take at firſt eight ounces, with one ounce of weak lime-water. If this proves ſucceſsful, there ſhould be given to the patient, ſoon after, a ſecond doſe at night, when in bed; obſerving to purge every five days, to prevent the foulneſs the milk may admit of in the ſtomach.

6° Advantage will be found, in uſing the hot, or lukewarm bath, at different times; and ſeveral days together each time. It would be well to make the patient take mineral waters a little ferrugineous and ſaline; but ſlight and diuretic; ſuch as the waters of Forges, and the ancient waters of Paſſy.

7° Laſtly, it may be propoſed to the patient, to ſuffer an opening to be made by a cauſtic in one of her arms; to diſcharge a part of the humour, that has fallen into the breaſt. As I do not believe, that the humour, which will be diſcharged by the cauſtic, contributes to the production of the knots, I have not a great idea of this remedy; and I acknowledge, I have never ſeen the effect of it well aſcertained.

But

But as there is no great inconvenience in it, I think it may be ſubmitted to without heſitation, whenever it is propoſed.

Theſe remedies ſucceed, ſometimes, in more kindly knots, and in a ſlight *ſchirrhus*, if the patient be of a good conſtitution; and they be uſed at proper times: but they are not always attended with ſucceſs, in thoſe tumours of the glands that are malignant, nor in a perfect *ſchirrhus*; eſpecially if they be employed after many uſeleſs or injurious attempts to cure them, or when the diſeaſe has made ſome progreſs. The regret at ſeeing the knot, or *ſchirrhus*, become truly carcinomatous, will be the reſult ſometimes; and then there is no other method to be purſued than to extirpate it, before the diſeaſe be communicated to every part of the breaſt: having firſt prepared the patient, by a bleeding and a doſe of phyſic, and even, if it be judged neceſſary, by ſome whey, or broths made of herbs, taken during that time.

For the performing this operation, a biſtory or razor is made uſe of; the ſides of the handle of them being covered with a linnen bandage. The bottom of the wound muſt be felt, to know if there be any knot that is not extirpated; after which, the wound is to be filled up with lint, ſlightly preſt into it, and then the reſt of the dreſſing muſt be put over it; charging a perſon to keep their hand on them, till ſuch time as the blood be ſtopt.

In general, the patient is to be bled after the operation. The day after, the lint, if it adhere ſtrongly in the wound, ſhould be moiſtened; and the dreſſings are not to be taken off till the next day; and then often not entirely. The wound muſt be diligently dreſt then with plaſters, ſpread with a digeſtive newly made, and ſoftened with the yolk of an egg. This muſt be continued till the ſuppuration be almoſt finiſhed. Then the *linimentum Arcei* ſhould be made uſe of; to which ſhould be added, green balſam,

balſam, to prevent fungous fleſh; and when the wound is near being cicatrized, no dreſſings ſhould be employed; but it ſhould be ſprinkled with pulveriſed turpentine, and covered with lint.

The operation for a cancerous *ſchirrhus*, in which the amputation of the breaſt is to be performed, demands more dreſſing; is more dangerous; and generally attended with worſe conſequences. It is deſcribed in the *Traité des Tumeurs* in the above-quoted place; and in the following chapter it will be examined whether it ought to be practiſed; and in what caſes.

We ſhall content ourſelves here with obſerving, that it is rare, after the extirpation of a cancerous knot, to ſee a new one reappear; whereas it often happens that there appears a new cancer, after the amputation of a cancerous breaſt; which ſeems to proceed from two cauſes.

The *one* is, that in the cancer, which occupies a great part of the breaſt, all the neighbouring parts are diſordered, and have a ſtrong diſpoſition to a cancer; which ſhortly opens after the operation, particularly if the cancer has been of long ſtanding; which never happens if there be only a knot in the breaſt, and it has not much affected the neighbouring parts. The *other* is, that, in the exulcerated cancer, particularly when it is a long time before it be taken out, there paſſes into the blood much of the acrid humour, that is formed in the cancer; and after the operation depoſits a carcinomatous humour in the reſt of the breaſt, or in other parts of the body; of which there is no fear in a ſimple cancerous knot, that has not yet ſuppurated.

CHAP.

# CHAP. VII.

## *Of cancers of the breaſts.*

I Have no intention to treat of cancers here; becauſe I have ſpoken amply of them in the *Traité des Tumeurs*, *Book* IV. *Chap.* II. and with relation to the cancer of the breaſts, which is the moſt common and moſt known. But I reflected, that this fourth book of the diſeaſes of the breaſts, would appear imperfect, if nothing was to be found in it on the head of cancers. I was, for this reaſon, determined to ſpeak of them, though very briefly; and to content myſelf with giving an account of their eſſential principles; adding the obſervations I have been able to make, ſince the publication of the *Traité des Tumeurs*; referring, for the more detail explanations, to the place in that treatiſe I have before mentioned.

### § I.

### *Of the cancers of the breaſt, which are the moſt common and moſt known.*

Every cancer is a *ſchirrhus*, become painful, and ſubject to change its form, without any manifeſt cauſe. It is this which makes the eſſential character of cancers.

The cancer of the breaſts, of which we ſhall ſpeak in this article, is formed in two different manners. It ſometimes begins by a knot in the breaſt, which becomes gradually cancerous; as has been ſaid in the preceding chapter; and forms, at length, a true cancer; but ſuch a cancer, as occupies only one part of the breaſt.

At other times, the *ſchirrhus* occupies all the mammary body, as has been deſcribed in the firſt chapter

chapter of this book, and becomes gradually painful; and at laſt is converted into a cancer that occupies all the breaſt.

Both theſe cancers may be conſidered as in two different ſtates. The *one* may be known by the ſchirrhous hardneſs, pain, ſhootings, and frequent change of figure, without the ſkin being broken; and then it is termed an *occult cancer*.

The *other* may be diſtinguiſhed when, all theſe ſymptoms ſubſiſting, and even augmenting, the tendinous coat of the breaſt, and the ſkin that covers it, being forced outwards, are torn, and ſuffer the body of the cancer to appear; which ſoon opens of itſelf: in this ſtate the cancer bears the name of an *open* or *ulcerated cancer*.

There may be found, in the place quoted from the *Traité des Tumeurs*, the other leſs important differences of cancers; and it may be conſulted at pleaſure.

## CAUSES.

I. It is certain, 1° That the ſchirrhous knots of the breaſts are produced by a collection of thick milk, which is there preſt, beaten, accumulated, and reduced to a ſmaller compaſs; whence comes the hardneſs, and reſiſtance of a *ſchirrhus*.

2° Whenever this compreſt milk does not act on the neighbouring parts, the *ſchirrhus*, that is formed, retains the ſame figure and magnitude; and remains perfectly indolent: or to ſpeak more properly, truly ſchirrhous.

3° But when it happens, which indeed is but too often, that the accumulated milk in the *ſchirrhus*, rarefies and expands; the *ſchirrhus* will then change its nature. It will encreaſe without manifeſt cauſe, by the expanſion of the milk, inlarge unequally, and gain different figures; becauſe the milk expands unequally

unequally in different parts. It will become painful from the expanſion of the milk; and, by encreaſing conſiderably its volume, will diſtend ſtrongly the nerves that are diſtributed there. It will be ſubject to ſhootings, cauſed by ſudden dilatations of ſeveral parts of the *ſchirrhus*, which make, in ſeveral of the nervous fibres, an acute, ſudden, and momentary diſtenſion. In a word, it becomes truly cancerous: or, to ſpeak more properly, an *occult cancer*.

II. As the milk, which has formed the *ſchirrhus*, continues to be diſtended and dilated, even more ſtrongly than at the beginning; 1° All the ſymptoms of the occult cancer continue, and go on to augment.

2° The principal increaſe of the cancer is then made in that part of the tumour, which is turned towards the ſkin of the breaſt: becauſe it is the part, from which the expanſion of the milk finds the leaſt reſiſtance; and it is in that part, likewiſe, where it forms the longeſt angles; which force more ſtrongly outwards, as well the tendinous integument of the breaſt, as the ſkin which covers it.

3° Laſtly, the tendinous covering and ſkin of the breaſts, in conſequence of being diſtended, and forced outwards, are torn at firſt into a very little fiſſure; that ſoon augments, and ſuffers the body of the cancer to appear; which by the continuation of the unequal dilatation of the parts, opens wider; and then the cancer bears the name of *open* or *ulcerated*.

III. In the theory that has been laid down, there are two things which require to be well cleared up. The *one* is, what proofs there are of the expanſibility which is attributed to the milk of the ſchirrhous glands, that has been propoſed as the cauſe of cancers? The *other*, what the cauſes are, that ſet this milk in motion, by opening the expanſibility of the milk of the ſchirrhous glands: which converts the *ſchirrhus* into a cancer?

Theſe

These two questions have been before discussed, as well in the *Traité des Tumeurs*, *Book* IV. *Chap.* II. as in this *Treatise on the Diseases of Women*, *Book* II. *Chap.* VII. For this reason, I shall content myself with answering them here, in a few words.

As to the first question, there are examples of a similar expansibility in plaster moistened with water; in iron filings mixed with urine and garlic; and in most mixtures; but particularly, in the small bubbles of glass called *les larmes de Hollande*; that burst by being put into cold water; which, by condensing their parts, give them a surprising expansibility. It is not irrational to suppose a similar expansibility in the milk of a *schirrhus* of the breasts; but we do not suppose this expansibility to be intirely proved by the rapid and unequal encrease of the *schirrhus*, which degenerates into a cancer.

As to the second question, we have said in the two places above-quoted, that the only cause which puts in action the expansibility of the milk of the schirrhous glands; and which, if I may so say, sets it loose, is the heat these glands are exposed to; that, by rarefying the milk they contain, enable it to break through its confinement, and spread itself. Now the causes which may communicate that extraordinary heat to these glands, are known: they may be reduced to the three following heads; with relation to which, it is proper to remark, that the causes are precisely such as all the world acknowledges to be those, which convert schirrhusses into cancers.

The first is the augmentation of the natural heat of the blood in all the body, by a fever; the improper use of an acrid, saline, or heating diet; the use of too strong solvents employed imprudently to resolve a *schirrhus*; want of sleep; violent passions; the habit of drinking strong liquors or coffee.

The second is the augmentation of the heat of the blood in the *schirrhus* itself, from some particular cause, as the coming on of an inflammation, in con-

conſequence of a blow on the breaſt; the too rough and frequent handling the knot or ſchirrhous tumour; the application of hot, diſcutient, and reſolvent topics; the uſe of which is always improperly made on theſe occaſions.

Laſtly, the third is the augmentation at the flux of blood into the breaſt, cauſed by a general *plethora*, a fever, or the handling of the tumour.

I ought not to omit two obſervations, which may confirm what I have ſaid of the expanſibility of the ſchirrhous matter, as a cauſe of the cancer.

As to the firſt, 1° It is certain, that the more the *ſchirrhus* is hard, reſiſting, and indolent; and formed of a more compreſt, compact matter; or, to uſe the terms of art, the more *perfect* the *ſchirrhus* is, the more the cancer, which proceeds from it, is ſubject to great and rapid changes; violent and ſhooting pains; and a more malignant nature: which can only come from this, that the ſchirrhous matter being more ſtrongly preſt, and condenſed, ſpreads itſelf, when the cancer opens, and extends the diſeaſe with greater force and rapidity.

2° It is certain, that if, on the contrary, the *ſchirrhus* be leſs hard, indolent, and formed by a leſs compact matter: or, in other words, leſs perfect; the cancer, that comes from it, alters its form leſs, by changing more ſlowly; is leſs painful, and ſhooting; and, in ſhort, is more gentle: which, for the contrary reaſon, can only proceed from the ſchirrhous matter's being leſs preſt; and more feebly and ſlowly dilated.

The other obſervation is, that between the cancers of the different parts of the body, made by the congeſtion of different humours, there are not any, which change their form and figure; turn their edges more outwards; and cauſe more lively and ſhooting pains, than that of the breaſts. As it cannot be attributed to the acrimony of the milk that forms it; which is the moſt mild humour of the blood;

blood; it muſt be granted, that it can only ariſe from the condenſed milk's having a greater expanſibility than the other humours; which renders the cancers that it forms, ſubject to greater, and more ſudden changes; and more cruel pains.

## SYMPTOMS.

Not to repeat what I have ſaid elſewhere more than once, I will only enumerate here, the principal ſymptoms of a cancer of the breaſts, in the moſt brief manner. If more detail explanations be deſired, the places before-mentioned may be conſulted.

1° As ſoon as the cancer is opened, its edges fold outwards; which goes on augmenting. This proceeds from the edges of the cancer dilating and extending, when, at the ſame time, the ſkin that holds it is not extended; which forces the edges to turn outwards. It is juſt like the edges of the fruit *momordica*, or *male balſam-apple*; which burſts and turns outward, upon the leaſt touch of it; becauſe the interior ſurface of this fruit is ſwelled and extended, and the exterior is not ſo.

2° There ariſes, from the bottom of the ſides of the open cancer, much proud and fungous fleſh: which is in conſequence of the expanſibility of the matter of the cancer. Whence it may be obſerved, that this *fungus* abounds particularly in malignant cancers; in which the milky matter, being more compreſt, is, in proportion, more expanſible.

3° Theſe funguſſes, being formed by a very rarefied matter, have no conſiſtence. They diſſolve therefore of themſelves, only on being expoſed to the air, and are reduced to a fetid and cadaverous *ſordes*: but they are ſucceeded ſoon by others, from the ſame cauſe; and even ſometimes more numerouſly.

4° Before the formation of the proud, and fungous fleſh, there flows from the open cancer only a lymphatic *ſerum*, charged with ſome parts of blood, that

that ooze from the wound, which render it red, or at leaſt reddiſh. But, when the *ſordes* of the fungous fleſh is diſſolved, this *ſerum* becomes thicker, more acrid, fetid, and entirely cadaverous. This *ſerum* is therefore called *ichorous*, and is the humour, which generally diſcharges from ulcerated cancers.

5° The open cancers are ſubject to frequent hæmorrhages; which proceed from this, that the portions of the matter that forms it are torn, by being unequally tumefied and diſtended, and tear, at the ſame time, the blood-veſſels that unite them. If theſe blood-veſſels be large, and particularly arteries, the hæmorrhage is conſiderable; but is leſs, if they be ſmall, or only veins.

6° There iſſues from open cancers, ſometimes, a conſiderable quantity of red or reddiſh, acrid, and fetid *ſerum*, which there is no reaſon to expect. In the unequal expanſion of the different parts of the cancerous matter, it often happens, that in receding from each other, they leave cavities, which are full of lymph, that tranſudes between them, and becomes ſoon red, reddiſh, acrid, thick, and fetid, by the mixture of a ſmall quantity of blood, and the filth that is detached from parts of this cavity. As long as the cavity remains firm, that lymph remains ſhut up: but the variations, that happen in the form of the cancerous maſs, produce ſoon an opening, by which it is diſcharged.

7° As the cancerous breaſt, and ſkin which covers it, encreaſe conſiderably, the veins diſtributed on the ſkin muſt grow larger, alſo, in proportion, and become varicous; the more, as the volume of the cancer compreſſes them, and retains the blood in it; which adds to the ſwelling.

8° The cancer is always, in the beginning, *moveable*, that is to ſay, it does not adhere to the pectoral muſcles, nor the ſides; becauſe the mammary body, in which it is ſituated, is not affixed to them. But it is quite the contrary with cancers of a longer ſtanding;

as they almoſt always adhere to thoſe muſcles, and to the ſides; becauſe in increaſing it coaleſces with them.

9° The thick milk, that paſſes from the carcinomatous breaſt into the glands of the arm-pits, by the lymphatic veins, inſpiſſates ſoon the milk which is in theſe glands; and produces there at firſt a ſimple obſtruction, which becomes ſchirrhous and even carcinomatous by the ſame progreſs, as we have ſeen in the changes made in the mammary glands.

10° Thence ariſe the knots in the arm-pits ſo common in cancers: which when they increaſe, as all cancerous ſwellings do, compreſs the axillary vein, that carries back the blood from the arm, and the lymphatic veins that carry back the lymph; ſo that theſe two humours, in conſequence of being retained, then ſwell extraordinarily the arm, and render it very painful.

11° I have ſometimes ſeen, in theſe circumſtances, a mortification appear ſuddenly in the arm, when thus tumefied, and haſten the death of the patient, at a time when the cancer would not ſo ſoon have done it.

## DIAGNOSTIC.

I. The exiſtence of a cancer appears to the ſight: and it is even eaſy to judge, whether it be great or ſmall; moveable or fixt; and occult or ulcerated; but it requires a little more examination to know whether it be malignant or mild. To which end, it is neceſſary to conſider the attendant ſymptoms. If the pains be acute, with frequent ſhootings; the changing of its form be almoſt continual; fungous fleſh be increaſing in it; and the humour diſcharging from it be foul, thick, or fetid; there is a certainty that the cancer is malignant. It may, on the other hand, be regarded as mild, if the pains be ſupportable; the ſhootings not frequent: the

ſame form retained a long time; the fungous exceſcences ſmall; the fluid diſcharged clear and lymphatic; and the *fœtor* not very offenſive.

II. The moſt important articles of the diagnoſtic are to know, 1° Whether the cancer proceeds from an internal cauſe; or from ſome exterior or accidental one: and this may be known from the patient. 2° Whether the patient have the *menſes* or not: if there be any irregularity in them; or if the time be paſt: all which ſhould be aſked her. 3° Laſtly, if the patient be healthful; of a good conſtitution; without any vicious humour in the blood, or any conſtitutional diſeaſe; cacochymic, or ſubject to have humours fall on particular parts; or have the ſcurvy, *ſcrophula*, or venereal diſeaſe; all which ſhould be endeavoured to be diſcovered, by examining the ſtate of the patient with care; and as well the different diſorders ſhe labours under at preſent, as what ſhe may have formerly undergone.

## PROGNOSTIC.

I. The confirmed cancer of the breaſts, that is to ſay, ſuch as ſhews itſelf to be ſo by the acute pains, frequent ſhootings, almoſt continual changing the form, and the rapidity of its increaſe, is abſolutely incurable. There is no remedy known capable of diſſolving the cancerous maſs, to procure a reſolution or ſuppuration of it; and, if there were any remedy capable of producing ſuch an effect, it is to be feared, it would only ſerve to accelerate the ripening and expanſion of the cancerous matter; and conſequently to heighten the progreſs of the cancer.

II. It only remains, therefore, to purſue one of the two methods, to extirpate the cancer by amputating the breaſt; or to endeavour to aſſwage, and mitigate the ſymptoms, by palliative remedies. Both theſe method are, however, but ſad reſources.

The extirpation is impracticable, when the cancer adheres to the pectoral muscles, and the sides: when it is accompanied with cancerous knots, in the arm-pits; or even such as are still schirrhous, but ready to degenerate into cancers. It is my opinion it ought not to be undertaken, when the cancer proceeds from an internal cause, or the patient is cacochymic, irregular in her *menses*, or subject to constitutional disorders, by which the blood is vitiated with some alien *virus*. I should be scrupulous in advising it, in the case of a young healthful patient, whose *menses* were regular, unless when the cancer came from an accidental cause; because I have never seen the extirpation of a cancer of the breasts attended with success, but in such cases.

On the other hand, the palliative cure is a very indifferent method. It succeeds sometimes so far, as to prolong the patient's life; but they pay dearly for this delay, by suffering almost continual pains, which can only be moderated by the power of opium. I have often seen these pains brought to such an excess, that the patient has been compelled to consent to the extirpation, whatever repugnance she might have to it.

III. Whatever method may be taken, if the patient has the venereal disease, scurvy, or *scrophula*, it is proper to begin by curing the venereal disease; and by destroying or diminishing the virulence that supports the scurvy and *scrophula*; which is not easily to be effected: and in regard to which, great advantage may be drawn, from the observations that have been made in the preceding chapter.

IV. After the prognostic, that has been given, it is not very necessary to declare, that the danger is always greater in the malignant, than in the mild cancer; in that where the arm-pit is painful and tumefied, than in that where it is not affected; and, lastly, in a thin and bilious woman, than in those who are fat or full of blood.

METHOD

## METHOD OF CURE.

My deſign is not to inſert here the method of cure of the cancer of the breaſts; that would be to copy myſelf, which I am not diſpoſed to do. I have ſpoken with ſufficient perſpicuity in *Chapter* II. *Book* IV. of the *Traité des Tumeurs*, of the treatment of cancers of the breaſts, as well when the extirpation of them is reſolved on, as when the palliative cure is propoſed. I have explained the ſame treatment, but more ſuccinctly, in *Chapter* VII. *Book* IV. of this work: where I have related the ſeveral remedies, that have been propoſed for the cure of cancers, with the judgment, that ſhould be formed of them. Theſe places may be conſulted at pleaſure.

I ſhall content myſelf with adding two remarks. The *firſt* is, that at the time when the four firſt volumes of this work were publiſhed, the extract of hemlock began to be ſuſpected, from the repeated trials made of it, which correſponded very ill with the expectations that had been raiſed of it. But I may now ſay, that after a thouſand attempts, as well in the *ſchirrhus*, as cancer, the inefficacy of this remedy has cauſed it to be exploded.

The *ſecond* is, that it has been endeavoured, ſome time ago, to bring into vogue an earth, brought, as is ſaid, from Portugal, and on which great encomiums have been given; as are to all new remedies. But this powder has not had any ſucceſs; and is actually ſo intirely forgotten; that I heſitated, whether I ſhould ſpeak of it at all; and I have only mentioned it, to ſhew what caution ſhould be uſed, with reſpect to the approbation of new remedies; and how backward the public ought to be in adopting them.

## § II.

### *Of the other kind of cancer of the breaſts, leſs common.*

#### DESCRIPTION.

In the diſeaſe, we have already deſcribed, women diſcharge, at the beginning, from the end of the nipple, a greyiſh humour; of a greater or leſs degree of viſcidity; glutinous like corrupted milk; and without ſmell in the beginning, but acquiring afterwards ſome degree of *fœtor*.

For a long time, this humour is only diſcharged at conſiderable diſtances; and almoſt without any pain or change, in the volume, ſoftneſs, or colour of the breaſt. It is known, that this humour only comes from under the nipple, and *areola papillaris*, which ſurrounds it; becauſe, when it is diſcharged, the patient feels, in that place, a heat, and a kind of tickling ſenſation.

It often happens, that the humour, being too thick, paſſes with difficulty through the holes of the nipple; and is accumulated in the end of the breaſt. The *areola papillaris* then ſwells, and becomes painful; inſomuch, that the humour, diſſolved by the heat of the part, or the remedies applied, opens a vent and eſcapes; which makes all the accidents ceaſe.

I have ſeen women remain a long while in this ſtate, ſubject, from time to time, to a ſuppreſſion of this humour; which made them ſuffer for ſome days, without their diſeaſe growing ſenſibly worſe. But I have ſeen others, in whom the cavity, where this humour is formed, became callous, and ſufficiently reſiſting to merit almoſt the name of a mild *ſchirrhus*; in which this humour was more purulent, and continued to diſcharge by intervals, and the volume

of

of the breaſt was a little augmented; without the patient's being, in other reſpects, greatly incommoded.

But I have ſeen two perſons, in whom this cavity has grown cancerous, and ulcerated; deſtroyed the nipple, and formed a cancer, abſolutely incapable of reſolution and ſuppuration, and ſubject to very acute and frequent ſhooting pains. But this was in other reſpects a mild cancer, of which the edges did not turn back, nor the form ſcarcely change at all; and the *pus* was in ſome places pretty laudable.

It is eaſy to perceive, by this deſcription, that the diſeaſe in queſtion, is only a fiſtulous ulcer at the beginning, that this ulcer, for want of being deterged, becomes callous, and even ſchirrhous; and laſtly, that it degenerates ſometimes into a cancer of a particular kind, whoſe progreſs is not the ſame as that of common cancers.

## CAUSES.

The ſeat of this diſeaſe is under the nipple, in the place where the lactiferous ducts communicate with each other: whence it happens conſequently, that the ulcer, which is formed there; and which is the origin of this diſeaſe; muſt proceed from the acrimony of the milk or milky humour, that ſtagnates there. Moreover, it is a fact, that I have obſerved this diſeaſe only in women, who are irregular in their *menſes*, or who have them already ſuppreſſed; in which caſe, the uterine milk flows back into the breaſts, and is vitiated there. It is, however, very poſſible, that a blow, or compreſſion, in that place; or a too frequent handling of the nipple, may give riſe to it.

If this ulcer could be deterged; or at leaſt the purulent matter, formed there, be diſcharged freely; there is reaſon to believe it would be cured of itſelf, or that it would not grow worſe; but neither the one nor the other is poſſible. The *pus* thus ſtagnating in the ulcer, being abſorbed into its *parietes*,

renders them callous; which goes on augmenting every day, to such a degree, that the ulcer, when it opens, forms an open cancer.

These changes happen slower or more suddenly, accordingly to the good or bad constitution of the patients; the state of their blood; and the regularity of their *regimen*; which contributes still to render the cancer, that results from it, in a better or worse state.

## SYMPTOMS.

1° In the beginning there is in the diseased part, neither heat, redness, tumefaction, nor pain; and the patient only can perceive the disorder, by the stains which appear from time to time, first, on her linen.

2° Afterwards, when it happens, that the *pus* is accumulated, because it is too thick to pass out; or because the end of the lactiferous canal, from whence it must be discharged, is closed by some crust, that the preceding discharge has left there; the patient is warned of this by the swelling, heat, and tension of the part; and by the pain she feels there, during several days, even till the *pus* makes its way, and is discharged.

3° When the ulcer becomes callous, the diseased part remains constantly tumefied, tender, and painful; which goes on augmenting, as the callosity of the ulcer increases.

4° Lastly, the ulcer opens; and the nipple, corroded at its base, falls off, and forms an open and ulcerated cancer; but with all the characteristics of a mild one.

## DIAGNOSTIC.

It is easy to know this disease in all its states, by the description that has been given of it.

In

In the beginning, by the drops of *pus* that flow from it; which ſtain, from time to time, the patient's linen.

Afterwards, by the pain, heat, and ſwelling that is felt there, when the diſcharge is ſuppreſt; and, particularly, by the abundance of *pus* which iſſues from it.

When the ulcer is callous, by the ſwelling; hardneſs; reſiſtance, that is felt in it; and the augmention of the pain.

Laſtly, when it is open and ulcerated, by only looking at it; which diſcovers in it all the ſigns of a cancer, at leaſt of a mild one.

## PROGNOSTIC.

The ulcer of the end of the breaſts is a very bad diſeaſe; as it is eaſy to judge, from the conſequences that attend it.

It is ſo much the worſe, as no efficacious means of relief, ſuch as the opening and dreſſing of it, can be employed; and therefore it is proper only to uſe general or palliative remedies, which often have no effect, or ſuch as is very uncertain.

It is true, that this ulcer remains ſometimes in the ſame ſtate, without making any progreſs, or ſuch only as is very ſlight; but it ſometimes degenerates at laſt into a cancer; which, though mild, cannot be cured but by extirpation; ſuppoſing that to be practicable.

## METHOD OF CURE.

The beſt method of practice, for this diſeaſe, would be, as ſoon as the ulcer is confirmed, to make, under the nipple, in the *areola papillaris*, an inciſion at the moſt dependant part of the place where the ulcer is perceived to be, by the hollow that may be felt there. This inciſion ſhould be longitudinal, according

cording to the direction of the nipple; and care ſhould be taken, not to cut the lactiferous ducts; as alſo, to make the inciſion from the baſe of the nipple, towards the body of the breaſt, large enough to be able to dreſs the ulcer conveniently; avoiding, as much as poſſible, to hurt the ſubſtance of the breaſt. By this means a free paſſage will be opened for the diſcharge of the *pus*: and the ulcer ſhould be injected, at firſt, with deterſives, made with barley water, and honey of roſes: and, afterwards, it is proper to promote the regeneration of the fleſh; and the *cicatrix* of the ulcer, by the uſe of the thermal waters of Bareges, Balaruc, or Bourbon. The ulcer ſhould be dreſt regularly, with a digeſtive, moiſtened with a little tincture of myrrh; or with the *linimentum arcei*, mixt, if it be neceſſary, with a little green balſam: by which means, a radical cure may be obtained. This is what may be properly termed *medicina efficax*.

I confeſs, I have not had the courage to follow this method in the caſes which I have ſeen: on the one hand, the diſeaſe appeared to me too far advanced, and I was afraid to accelerate the production of a cancer; and on the other, I was not willing to propoſe an operation, for which I knew no precedent. But, at preſent, after mature reflection, I believe I ſhould adviſe an operation to others, though I had not the courage to practiſe it myſelf.

If this method be not taken, there is no other reſource than to employ palliative means, whether the diſeaſe remain a ſimple ulcer; become an occult cancer; or opening form an ulcerated cancer. This treatment conſiſts in obſerving a regular *regimen*; and employing common remedies, proper to dilute and ſweeten the blood, to diminiſh its volume, and evacuate the vicious humours, with which it may be charged. We have ſpoken of this cure with ſufficient perſpicuity in the preceding chapter; but more ſo in the *Traité des Tumeurs*, *Book*

*Book* IV. *Chapter* II. and even in *Book* II. of this work, *Chapter* VII. where we have explained the method of cure of the cancer of the *uterus:* which may be conſulted. Theſe remedies, ſkilfully and duly adminiſtred, have often the ſucceſs to mitigate the ſymptoms, and retard the progreſs of the diſeaſe; but as they are not always ſucceſsful, their inefficacy, being perceived, throws the patient into a deſpondency, and inquietude, which, by vitiating the blood, augments the diſeaſe.

## CHAP. VIII.

### *Of the diſeaſes of the nipples.*

#### DESCRIPTION.

THE diſeaſes of the nipples may be reduced to the four following kinds.

1° To excoriations, by which, the fine and delicate ſkin, that covers them, and is called *Epithelion*, is ſwelled, not only at the end; but even at the ſides.

2° To the *Aphtæ*, that is to ſay, little ulcers, round, hollow, and full of an adheſive greyiſh matter, like down, that covers the whole ſurface of the nipple, but particularly the ſides; cauſes there an acute pain; and often brings on an inflammation.

3° To *Sciſſuræ*; that is to ſay, chappings or circular chinks, which ſurround the nipple, particularly towards its baſe; form hollows; and cauſe pain and inflammation.

4° To the falling off of the nipple, which is ſeparated from the breaſt in ſeveral caſes.

CAUSES.

## CAUSES.

The cauſes of theſe different diſeaſes are apparent.

1° The excoriation comes from the acrimony of the *ſaliva* of the child who ſucks; which erodes the ſkin of the nipple. This principally happens when the children breed their teeth; when they are affected by the cholic; and when they have a fever; becauſe then their blood is heated; and furniſhes a more acrid *ſaliva*. Sometimes theſe excoriations are cauſed by a bite with teeth, which the child gives to the nipple in ſucking.

2° The *aphtæ*, or little cavernous ulcers, are produced nearly from the ſame cauſes, when they are more powerful; and conſequently capable of corroding the nipple deeper. Theſe *aphtæ* begin always by a little pimple or riſing; which, burſting, forms the circular *aphtæ* that ſucceeds it.

3° The *ſciſſuræ*, or choppings of the nipple, are owing to the ſame cauſes. 'Tis the thick *ſaliva* of the child, accumulated around the baſe of the nipple, which gets into the circular wrinkles, that are there, and excoriates them. Theſe *ſciſſuræ* are ſometimes ſuperficial; and ſometimes deep; according as the *ſaliva* is more or leſs acrid; or as the texture of the nipple is more or leſs lax.

4° As to the end of the nipple, it is ſeparated, and falls off, when any abſceſs or cancer, forming at the point of the breaſt, undermines and ſuppurates it; or when the *ſciſſuræ*, formed at its baſe, in conſequence of deſtroying the ſubſtance underneath, eradicates it entirely.

The cauſes we have mentioned, are confined to the acrimony which the *ſaliva* may contract in certain caſes in children, otherwiſe healthful, and of a good conſtitution. But when it happens, that children are tainted, and their *ſaliva* infected with venereal *virus*, the diſorders that are cauſed by it, are much

much more conſiderable; and merit the name of venereal ulcers.

Although we have here ſpoken of the diſeaſes of the nipples, as only belonging to thoſe women who give ſuck, to which indeed they are moſt common; yet other women may be affected with them, when they have the compliance to ſuffer their lovers to ſuck their breaſts; which is an *incentivum voluptatis.* As the *ſaliva* of theſe lovers is always more acrid than that of children: and, as it is not always free from infection, the women often contract diſeaſes in the nipples; for which it is neceſſary to apply for relief, without daring to acknowledge the cauſe.

## SYMPTOMS.

The excoriations, *aphtæ*, and *ſciſſuræ*, of the nipples, are always accompanied with violent pain: and it is no matter of ſurpriſe, when we conſider the ſenſibility of the part.

This pain is inſupportable, when the nipple is given to be ſuckt, on account of the motion and preſſure the child makes on it; and the acrimony of the *ſaliva*, which is abſorbed by the ulcers that are in it.

The breaſt therefore cannot be given to the child; and the child would moreover even refuſe it. Thus then, if this breaſt be full of milk, as is generally the caſe, recourſe muſt be had to one of the two expedients, propoſed in the ſecond and third *Chapters* of this *Book:* by which means, the milk may be evacuated without pain.

With regard to the falling off of the nipple, it is a miſchief without remedy; and the other breaſt muſt ſupply the place of it. I have ſeen a woman who gave ſuck, that has had the misfortune to loſe the nipple of one breaſt; by which the breaſt had grown leſs, and did not contain any milk. But the other

other breaſt had increaſed proportionably, and furniſhed as copious a quantity of milk as was neceſſary for the nouriſhment of a child.

## DIAGNOSTIC.

The excoriations, *aphtæ*, and *ſciſſuræ*, or chaps of the nipples, being viſible, are conſequently eaſily known and diſtinguiſhed. As to the falling off of the nipple, it may be foreſeen, by obſerving the abſceſs or cancer which is formed under it; or by the deep *ſciſſuræ* that ſurround the baſe of it.

The common cauſe of theſe diſeaſes is the acrimony, which the *ſaliva* of the child acquires in different diſorders. It happens ſometimes, even, that the child's *ſaliva* is infected with venereal *virus*; which gives riſe to much more conſiderable diſeaſes. But this is ſoon known, by examining the body of the child; and, particularly, by the inſide of its mouth, where marks of the diſeaſe with which it is affected, will be found.

With regard to women, who without giving ſuck, are found to be in danger of any of the diſeaſes of the nipple; they ſhould be treated in the method mentioned hereafter, without inquiring into the cauſe which has given riſe to them.

## PROGNOSTIC.

The diſeaſes of the nipples, when they come from a ſimple cauſe; ſuch as the acrimony of the *ſaliva* of a child, who is in other reſpects healthy, are without any danger; however, they ſhould not be entirely neglected.

But when they proceed from a venereal *virus*, communicated by the child, they muſt be regarded as a certain venereal ſymptom: and there is no other method to purſue, but to adminiſter immediately mercu-

mercurial unction, in order to cure the woman and her child.

The falling off of the nipple may be prevented, by ſtopping the progreſs of the *ſciſſuræ*, that undermine it, provided there be time. But when it proceeds from an abſceſs, or cancer, there is no means of hindering it.

## METHOD OF CURE.

I. If the excoriations, *aphtæ*, and *ſciſſuræ*, be attended with inflammation, and be very painful; 1° The patient ſhould be bled; and the diſeaſed part bathed, with equal quantities of milk, and the decoction of yellow mallows; and even a cataplaſm of the crumb of white bread and milk, ſhould be applied to it.

2° As ſoon as the pain, and inflammation are diminiſhed, the nipple ſhould be waſhed with barley water, or Saint John's wort water, in which a little honey of roſes may be mixt; which ſhould be done with a ſponge without rubbing.

3° After this lotion, the breaſt may be anointed with oil of wax or eggs, ſprinkling it afterwards with powdered gum tragacanth, or with pulverized ſugar: or, if it be liked better, to cover it with ſome very gentle pledgets, dipt in theſe oils, and ſprinkled with gum tragacanth or ſugar.

4° Sometimes the leaves of *Geranium Robertianum*, or Herb Robert are uſed; which, being pounded in a marble mortar, till they be reduced to a paſte, the nipple is to be covered with it; or what is better, the juice is preſt from this paſte, and little pledgets are dipt in it, which are applied to the nipple.

5° To keep on what is applied to the nipple, a nipple-bag is uſed; that is to ſay, a kind of cap, made with wax, or a thin plate of lead. There are alſo ſome made of tin, caſt in a mold, but they are too

too ponderous. It is proper, that the cavity or form of this little bag be large, and deep enough to contain the nipple, and dreſſings. The marginal part ſhould be ſufficiently cloſe, and extend over the *areola*. At every dreſſing, this bag ſhould be waſhed before it be uſed again; and it ſhould be kept on the part by the means of a compreſs and bandage.

6° When theſe ſore nipples do not ſuppurate, they may be waſhed with lime-water, in order to dry them; and covered with a piece of linen, ſpread with white reſin; or a plaſter of ceruſs or *pompholyx*.

7° It is proper, during this treatment, to be careful to have the ſound breaſt ſuckt dry, twice a day, in order to make a reſolution of the milk, and hinder its being carried ſo abundantly to the diſeaſed breaſt, where it would retard the cure.

II. If the *aphtæ* and *ſciſſuræ* be perceived to be malignant, eroſive, and exede the nipple; and are attended with danger of its ſeparation; it is proper, in order to prevent the effect, to correct their acrimony, by applying ſome threads or pledgets of lint, ſpread with a little brown unguent, that is to ſay, with a ſuppurative mixture, in which, to every half dram ſhould be put ten or twelve grains of red precipitate; which ſhould be continued till the progreſs be ſtopt; and then the common treatment we have already propoſed, ſhould be followed.

III. If, moreover, by examining the mother and child, it appear, that they have the venereal diſeaſe; and that the diſorders of the nipple be a ſymptom of it; after having prepared the woman, by bleeding, purging, and bathing, it is requiſite to uſe mercurial friction, for her's and the child's cure. The friction ſhould be only of ſmall quantities of the unction; and at long intervals; ſo as not to bring on a ſalivation; and care ſhould be taken, to em-

ploy, in this treatment, four or five ounces of unction, made of equal parts of hog's lard and mercury.

IV. With regard to the falling off of the nipple, there are no hopes of preventing it, when it proceeds from an abſceſs or cancer under the *areola*. However, there is ſometimes a better proſpect, when the danger of the nipple's falling off proceeds only from the *aphtæ*, or *ſciſſuræ*, which erode it; becauſe the malignity of theſe ulcers may be corrected. But from whatever cauſe the falling off of the nipple reſults, nothing remains but to dreſs the ulcer, as a common one, and to endeavour to cicatriſe it; which may be always effected, when the diſeaſe proceeds from *aphtæ* or *ſciſſuræ*, and ſometimes, alſo, when it happens in conſequence of an abſceſs; but which nevertheleſs is not to be at all done, when a cancer is the cauſe.

When the nipple is deſtroyed only in part, which never happens, but by *aphtæ* or *ſciſſuræ*, it ſhould be endeavoured to lengthen it by means of ſucking; a method that will ſometimes ſucceed. But when it is fallen off entirely, the breaſt remains uſeleſs; and alſo gradually diminiſhes in ſize: the other however grows large in proportion, and often furniſhes alone as much milk as the two would have done. I have ſeen, as I ſaid before, a woman who was in this ſituation; and, with one breaſt only, nurſed a large and healthy child.

# CHAP. IX.

## *Of the defect of the milk, in women who give ſuck.*

### DESCRIPTION.

CHildren, at their birth, can only be nouriſhed with milk, their ſtomachs not being in a ſtate to bear, nor digeſt, a ſtronger aliment. Towards the ſixth month, but not before, a little clear broth may be given them. The quantity and ſtrength may be augmented towards the twelfth, and from thence to the eighteenth month; at which time, they are generally weaned; after which, they ſhould have more and ſtronger broth; and even ſoop, well diluted, to accuſtom them to a more ſolid food, which muſt ſupply the place of milk.

It is proper, therefore, in the order of nature, that women who give ſuck, have milk enough to furniſh their child with its proper nouriſhment, to the ſixth month, two thirds to the twelfth, and a half, at leaſt, to the time it is weaned. It is a diſeaſed ſtate, when they cannot admit of it; not with relation to themſelves, for, in general, they do not ſuffer in their health though they want milk, but in regard to the child, which, in that ſituation, they are intended to ſuckle, and yet cannot. In the ſame manner, barrenneſs, which is not a diſeaſe as to barren women, who often enjoy the moſt perfect health, is nevertheleſs, with reſpect to the order of nature, a diſeaſe; becauſe the women do not perform a function for which they were deſigned.

It is difficult, to fix the quantity of milk, that a child ſhould have; becauſe it varies according as the child is more or leſs hungry; from whence it reſults, that a woman, who has not milk enough for the

the nouriſhment of one child, may have ſufficient for another. So that no certain rule can be eſtabliſhed with regard to it. It is, however, eaſy to judge, when a child wants milk, by the falling away, and ſoftneſs of its fleſh; by its eagerneſs for the breaſt, and the pains it takes to ſuck; and by the nature and quality of the matter it evacuates, and the ſwelling of its belly; as we ſhall ſee in the diagnoſtic.

## CAUSES.

We have obſerved heretofore in Chap. I. of this Book, that the milk is a part of the chyle, which the *primæ viæ* furniſh to the blood; that is perfected and ſweetened by circulating with the blood; and, laſtly, being ſecreted in the breaſts, forms the milk deſtined for the nouriſhment of the child. Theſe three circumſtances combine, therefore, to the formation and abundance of the milk; and it is only by defect of ſome one of them, that the milk can be defective in a woman otherwiſe of good conſtitution; ſo that all the cauſes of the defect or want of milk, muſt be referred to one of the three following heads.

I. If the women who give ſuck, furniſh but a little chyle to the blood, which happens, 1° When they naturally eat but little: 2° When they have weak or bad ſtomachs, which digeſt the aliments badly; inſomuch, that, when they have taken a ſufficient quantity of food, they extract only a ſmall quantity of chyle from it: 3° When they have any degree of habitual looſeneſs; which occaſions, by the too ſudden paſſing off of the matter, a loſs of part of the chyle contained in it.

II. If the women who give ſuck, are ſubject to any evacuation, by which they loſe a part of the chyle, that has paſſed into the blood; as 1° When they have their *menſes*, contrary to the generality of

women, in that ſituation, particularly if the diſcharge be copious: 2° When they are ſubject to a continual and abundant diſcharge of the *fluor albus*: 3° When they have habitual frequent ſweats; eſpecially in the night: 4° When they become pregnant, while they give ſuck: for then, a part of the chyle, that ſhould furniſh milk for the child, paſſes into the lactiferous veſſels of the *uterus*; and ſerve to nouriſh the *embryo* there; which is the moſt common cauſe of the defect of the milk, in women that give ſuck.

III. If there be, in the breaſts of women who give ſuck, any local fault, that is produced there, and retards the ſecretion of the milk; as, 1° If they have the mammary body naturally ſmall and flat, which is common to thoſe women whoſe breaſts are ſmall, flat, and adhere to the cheſt: 2° If the mammary body be found ſhrunk, and contracted by age; as the *uterus* itſelf begins to be contracted at the ſame time; whence it proceeds, that women who are above forty years of age, do not give ſuck ſo well as thoſe who are only twenty or twenty-four: 3° Laſtly, if there be, in the body of the breaſts, any knot or tubercle, or at leaſt any *cicatrix*, that an abſceſs which has preceded it, may have left; and which, by compreſſing the mammary body, cloſes it; and retards the ſecretion of the milk.

Each of theſe cauſes may occaſion, in particular, a diminution in the quantity of the milk; and this diminution will be greater, if two or three of them are combined; which may, and often does happen.

## SYMPTOMS.

The ſymptoms of the want of milk are not to be ſought for in the women who give ſuck, as they ſuffer no other diſorder, than the concern at being ſucked by a child dying of hunger; but in the children

children themſelves; who really ſuffer from this deficiency in more than one way.

1° They do not receive a ſufficient quantity of milk; and muſt conſequently grow thin, and have their fleſh ſoft.

2° The women, to make up for the want of milk, give them broth, and in too great quantity; as their ſtomachs are too weak to digeſt it. This therefore is obſtructed in their bowels, and produces coſtiveneſs.

3° It is a neceſſary conſequence of the coſtiveneſs, that the broth, when continued to be given to theſe children, is accumulated in, and ſwells the inteſtines; whence the hardneſs and tenſion of the *abdomen*.

4° In this ſituation, the hunger theſe children undergo, is a painful ſenſation. The tenſion and tumefaction of the belly, is another yet more ſo. Being troubled without intermiſſion by theſe ſenſations, they cannot ſleep, or at leaſt very unquietly; and thence proceeds their wakefulneſs.

5° The food, in conſequence of being accumulated in the bowels of children, muſt diſtend them, and cauſe very acute pains; which is the cauſe of the colic they endure.

6° Theſe colics are ſometimes ſo violent, that the animal ſpirits, puſhed ſtrongly towards the brain, flow from thence irregularly, and impetuouſly into different muſcles; that they put into contraction: which cauſes the convulſions, and convulſive motions.

7° The matter retained in the *primæ viæ*, in conſequence of ſtagnating there, and being expoſed to the heat of the bowels, which the pain augments, muſt become acid: ſo that, paſſing into the blood, it muſt produce ſlight but frequent ſhiverings, followed by a proportionable fit of an ague.

8° It ſometimes happens, that this acid matter ferments and becomes fluid; it produces then

ſuch a ſolution, as relieves the patient for ſome days; but the ſame ſymptoms ſoon return, unleſs the cauſe, which gives riſe to them, be removed.

## DIAGNOSTIC.

If women who give ſuck, were juſt, they would acknowledge of themſelves their want of milk, and not endanger the health of their child. But on the contrary, the women who are hired, take great care to hide their ſtate, not to be deprived of the profit they reap; and others, who nurſe their own children, endeavour to prolong, as much as they can, their own ſuckling of them, from a repugnance to give their child to another nurſe.

But there is no neceſſity of a confeſſion from the woman, to know the defect of their milk. It can be eaſily diſcerned by many certain ſigns.

By their not having their breaſts full, and firm; but always ſoft and flaccid.

By the child uſing all its force, when it ſucks, and ſwallowing very little milk; which may eaſily be diſcerned.

By its never making the milk come out ſtrongly; that is to ſay, not cauſing a contraction in the breaſts, when it ſucks, ſo as to occaſion the ruſhing out of the milk, without having any other trouble than that of ſwallowing it.

By the child's growing thin, falling away, and having its fleſh ſoft, without any appearance of diſeaſe.

By its being always greedy, and never throwing up the milk, as young children do; becauſe, ſo far from having taken too much, it never gets enough.

By its belly being tumefied, diſtended, and coſtive to ſuch a degree, that it has only a ſtool once in two days, and ſometimes only in three.

By the excrement it voids at laſt; which is not yellow, and ſoft or liquid, as that which comes from milk;

milk; but hard, compact, almoſt like chalk, and of a greyiſh colour; which evinces, that it is produced from the broth with which the child is nouriſhed.

By its being ſubject to frequent colics, ſometimes violent enough to throw it into convulſions; which reſemble epileptic fits.

Laſtly, by its not ſleeping or ſleeping ill, with frequent ſtartings; and having often a little ague fit, without any apparent cauſe.

## PROGNOSTIC.

If women who give ſuck be in any danger, when they want milk, it is not becauſe they want it, but on account of the circumſtances which make them want it; and ſome of them may be attended with bad conſequences. However, the explanation of the dangers, that may happen to women who give ſuck, and want milk, does not properly belong to this treatiſe. It is not the ſame with reſpect to the children, who are ſubject, when their nurſes want milk, to real, and very conſiderable dangers, from that cauſe only.

1° The defect of a ſufficient nouriſhment will ſoon make the children fall into a feeble and conſumptive ſtate: to which, if neglected to be remedied, a fatal conſumption will enſue.

2° Coſtiveneſs, which proceeds from the uſe of broth, that is given to them, to ſupply the want of milk, and which ſhould not be given to them. For by filling the bowels, it occaſions a compreſſion of the *vena cava*, which comes from the inferior extremities, and of the *vena portæ*, which comes from the inteſtines; and oftener ſtill a compreſſion of the lymphatic veins, which come from the ſame places, and occaſion an *œdema* of the inferior extremities, and a dropſy of the belly.

3° The violent colic, which the coſtiveneſs occaſions, often expoſes the children, by the pains it

cauſes, to convulſions: and even epileptic fits; which are generally fatal at that age.

4° Children, who have ſtrength to overcome the defect of milk in their nurſes, when it is only carried to a certain degree, never attain to the magnitude they otherwiſe would have done: but they remain ſmall, becauſe the want of nouriſhment has dried and hardened too ſoon, all the parts, and hinders the neceſſary expanſibility for their growth.

5° Laſtly, theſe ſymptoms are more common, and worſe, to children, the firſt months after their birth: becauſe, at that age, the want of milk cannot be ſupplied by broth, which their ſtomachs cannot digeſt, and which only fills their bowels: whereas children, more advanced in age, can digeſt broth well and even ſoop; and can ſurmount the want of milk in their nurſes without much inconvenience.

## METHOD OF CURE.

There are, in the *materia medica*, remedies ſaid to be proper to augment the milk, *remedia lac adaugentia:* but they are frivolous, inefficacious, and can only ſerve to amuſe the credulity of women. The only means to augment the quantity of milk, in women who want it, is to remove the cauſes that procured the diminiſhing of it; but theſe means are neither eaſy, nor ſafe: as we ſhall ſee below.

1° If it be believed, the want of milk comes from the woman's not eating enough, ſhe ſhould be exhorted to eat more; or nouriſhing aliments ſhould be given to her, as ſoups, rice and milk, gruel, and broth: her diet alſo ſhould be ſeaſoned to excite her appetite, provided it be done without exceſs.

2° If the want of milk ſhould appear to proceed from her ſtomach's being weak or digeſting ill, her diet ſhould be apportioned into four moderate meals, ſo as not to charge the ſtomach with too much at once. Aliments eaſy of digeſtion ſhould be given her:

her: and ſhe ſhould be made to take every morning half a glaſs of the infuſion of rhubarb; or fifteen or twenty grains of bark powdered; or half a dram of the *confectio hyacinthi*, or *confectio alkermes*.

3° Laſtly, if the woman have a natural tendency to a looſeneſs, ſo as to go to ſtool ſeveral times in the day; which, by carrying off a part of the chyle, diminiſhes greatly the quantity of milk; there ſhould be given her at night, when going to bed, half a dram of *diaſcordium*: or ſhe ſhould be made to take, in the day time, two cups of the infuſion of *catechu*.

II. If the want of milk be attributed to the copious diſcharge of the *fluor albus*, or *menſes*, or habitual nocturnal ſweats, ſuch remedies ſhould be employed as are proper for theſe diſeaſes. There may be found in this treatiſe, thoſe which are ſuitable to the two firſt, in Chapters XI. and X. of Book I.

As to the nocturnal ſweats, they ſhew a diſpoſition to a ſlow fever; but it is rare to find women who give ſuck in this ſtate. In all ſuch caſes, proper medicines for the ſlow fever ſhould be adminiſtred; but it is very common for women who give ſuck, to become pregnant, which takes away half the quantity of their milk, in conſequence of its going from the breaſts, unleſs it can be prevented.

III. Laſtly, if the women have naturally ſmall and flat breaſts, and conſequently the mammary body flat and ſmall; if they have knots or ſchirrhous bodies in their breaſts; or *cicatrices* of ulcers of long ſtanding, which diminiſh the volume of it; theſe three caſes are abſolutely incurable, and it is not proper to fatigue women by uſeleſs remedies.

But there is, in all theſe caſes, an eaſy method to be purſued, which, as ſoon as the woman is perceived to want milk, ſhould be immediately taken. This is, to change the nurſe; and take another, judiciouſly choſen, as well with regard to the quantity,

as

as quality of her milk. But if the mother ſuckle her own child, and be not in circumſtances to procure a nurſe who has milk enough, it is neceſſary to point out the moſt proper means to ſupply this want of milk, without injuring her child; that is to ſay, ſhe ſhould be deſired to give it only a little broth, if it be very young, and ſuch alone as is very clear; which will load it leſs; and to make it drink cow's milk, mixt with a third part of the decoction of barley, to dilute it ſtill more. She may afterwards give her child more broth, and even ſoop, that has been longer ſtewed, accordingly as it advances in age: and finally wean it towards the twelfth month, which may be then done eaſily, and without trouble; becauſe, at that age, ſhe gives ſcarcely any milk; and the child is habituated to do without it.

## CHAP. X.

### *Of the bad quality of milk in nurſes.*

SOmething more is requiſite, than that a nurſe ſhould have a ſufficient quantity of milk; it is neceſſary, at the ſame time, that her milk be good; and this is an article, of which the examination ſhould never be omitted in the choice of a nurſe. But ſometimes miſtakes are committed; and ſometimes alſo the milk, which was good at the time of examination, becomes bad in conſequence of ſome accident, or by the bad *regimen* of the nurſe. For this reaſon we ſhall examine the bad qualities the milk may acquire; and the means of correcting them.

#### DESCRIPTION.

The milk, to be good, ſhould be white, equal in its ſubſtance, of a moderate conſiſtence, ſweet, and with-

without any bad taſte : from whence it is eaſy to conclude, when the milk ſhould be regarded as vicious.

1° If it be too liquid, and apt to flow.

2° If too thick, and viſcid.

3° If it be ſalt or acrimonious.

4° If it be acid, or tend to ferment.

5° If it be bilious and bitteriſh.

6° The other faults that are remarked in the milk of nurſes, as being grumous, bluiſh, or yellowiſh, are not diſtinct qualities, but the effects of thoſe we have related above, as will be ſeen below. It is proper, therefore, only to treat here of the five firſt articles ; which appear to comprehend all the bad qualities that the milk may contract.

## CAUSES.

I. The milk is naturally ſerous in all women, the firſt months after delivery ; and this is neceſſary, in order to proportion the ſlightneſs of the nouriſhment to the feebleneſs of the ſtomach of the newborn child. This ſerous quality of the milk proceeds from the ſecretory pores of the mammary body being conſiderably dilated, by the abundance of milk brought into the breaſt after delivery, and ſuffering a conſiderable quantity of lymph to paſs with the milk ; but which diminiſhes gradually, accordingly as the pores regain their natural ſtate.

In like manner, the milk is naturally more ſerous in young nurſes ; and from the ſame cauſe. As, in young perſons, all the parts are more diſtenſible, the ſecretory pores of the mammary body become in young nurſes more dilatable and *permeable*; which occaſions the milk in them not only to be abundant, but in ſeparating, to draw with it a greater quantity of lymph.

The ſerous quality of the milk is, therefore, only a fault when it is in too great a degree ; which happens in the following caſes.

1° When

1° When the nurſe eats little, and has a bad ſtomach, which occaſions her to furniſh but little chyle to the blood; and, conſequently, little milk to the breaſts; in which caſe, the lymph of the blood ſupplies the defect.

2° When the nurſe is addicted to drinking much; and eſpecially water, which furniſhes too ſerous a chyle, and conſequently a milk of the ſame nature.

3° When the nurſe has the ſecretory pores of the mammary body naturally very large, in ſuch a manner, that the milk, which ſhould be ſecreted there, not filling them, there muſt paſs, at the ſame time, a quantity of the lymph of the blood.

II. The milk becomes naturally leſs abundant, and thicker, in proportion as its age recedes from the time of delivery, till it totally fails, towards the eighteenth or twentieth month. After the milk fever, the ſecretory pores of the mammary body, contract gradually every day, till they attain, at laſt, their natural ſtate. So that they muſt ſecrete every day leſs milk, and only ſuch as is pure; becauſe they do not leave room for the introduction of the lymph; on which account, it becomes every day thicker. This ſtate goes on augmenting gradually, till it occaſions no further ſeparation of the milk, which happens generally towards the twentieth month.

The milk is naturally thicker and leſs copious in old nurſes: becauſe, in old age, all the fibres and ducts of the body contract, and even the ſecretory pores of the mammary body grow leſs; and ſuffer only a little milk to be ſeparated; and do not leave a paſſage ſufficiently free to admit of the introduction of the lymph; which occaſions, that, in aged nurſes, the milk is proportionably leſs abundant and thicker than in thoſe who are younger.

It is certain the milk becomes naturally thicker, in proportion to the diſtance from the time of their delivery; and it is naturally thicker in nurſes who are old. At the ſame time, this thickneſs of the milk is not a reaſon for rejecting thoſe who are old; or

or whoſe milk is not new. It is known even, that a thick milk agrees better with a child a little advanced in age, than ſuch as is more fluid. It is therefore eaſy to judge, that the milk's being thick, ſhould be regarded as a fault, only where it is to a certain degree; which happens to very old nurſes; or whoſe milk is very faulty: to ſuch as eat much, are nouriſhed with groſs aliments, and drink wine: and laſtly to nurſes, who work in the day-time; who ſweat by working; and who, by conſuming the *ſerum* of the blood, diminiſh that of the milk.

III. The ſalt taſte is always a fault in the milk; but in a greater or leſs degree, according to the degree of ſaltneſs.

This vicious quality is communicated to the milk, when the nurſes eat much ſalt meat; when they eat a great deal of ſalt to their common victuals; and when they have blood naturally acrid and ſaline.

IV. It is the ſame with reſpect to the acidity of the milk, which is ſo much the more faulty in proportion as it is more ſenſible. The indigeſtions nurſes are ſubject to, from the weakneſs of their ſtomach, muſt always be attributed to their eating green or ſour fruit, ſallads and roots; and to the quality of the wine they drink.

V. The bitter taſte, and bilious quality of the milk, are always faults, and very conſiderable ones. They happen to thoſe nurſes who ſeaſon their victuals much, and dreſs them with rancid butter or ſtrong oil; who eat much garlic, or onions; who are of a bilious temperament; who are naturally choleric; or who have obſtructions in the liver, which hinders the bile from being freely ſeparated there, and ſurcharges the blood; and by a neceſſary conſequence the milk.

VI. The three laſt qualities obſerved in the milk, as being grumous, of a bluiſh colour, or inclining to yellow, are the effects of ſome of the qualities we have before mentioned. Thus, the milk is only

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grumous, when the acids, with which it is charged, thicken the flakes of the milk. It is of a bluiſh colour only, when, between the flakes of the milk, which are white, there are intervals occupied by a lymph that appears brown: this mixture, by imperceptible points of white and brown, gives the milk a bluiſh caſt. Now, this mixture happens in grumous milk, and ſuch as is too ſerous. Laſtly, the yellowiſh colour of milk proceeds from a mixture of the bilious parts, with which it is charged. Thus therefore, as has been ſaid, theſe three qualities are the conſequences and effects of the other qualities, that have been explained; and therefore do not require a more particular explanation.

## SYMPTOMS.

Nurſes ſuffer but little from bad qualities of their milk: but their children ſuffer much from it, though in different manners, and degrees.

I. The ſerous milk agrees with new-born children; and we have already remarked, that nature ſeems to have attended to their wants, by rendering the milk of every newly-delivered woman ſerous. It agrees, alſo, with all coſtive children who have been nouriſhed with a thick and old milk; or in whom dentition is difficult. In general, though ſerous milk nouriſhes but little, children are ſufficiently nouriſhed with it; provided it be copious; and they are well with it; becauſe this milk keeps the body open. The uſe of this milk can only, therefore, be dangerous, when it is extremely ſerous; and, conſequently, ſo little nutritive, that it ſuffers the child to fall into a conſumption; particularly ſuch as have a continual looſeneſs, which exhauſts them.

II. Too thick milk is almoſt always bad. It binds the children; and cauſes colics; which often give them convulſions. It thickens the blood, and humours

mours, that are ſeparated from it; which produces obſtruction in the liver, and other *viſcera*, that are often the buddings of diſeaſes, which open in the ſequel. It renders the lymph thick, and glutinous, which give riſe to bad obſtructions of the lymphatic glands. Laſtly, by thickening the ſebaceous humour, it cauſes milk ſcabs in the face, called in Greek *Achores*.

III. Saline and acrid milk is always bad. It gives children ſhooting pains and colics; it renders the *fæces* and urine ſo acrid, that the children have excoriations on and between their buttocks: it diſorders them; cauſes an almoſt univerſal itching; forms tetters; and brings on gradually a conſumption.

IV. An aceſcent milk turns acrid in the ſtomach; and the chyle it furniſhes, irritates the entrails, cauſes ſhooting pains, and brings on a looſeneſs. When this acrid chyle paſſes into the blood, it produces a ſlight ſhivering, which is ſoon followed with a fit of fever, more or leſs ſtrong; but which, in conſequence of returning very day, makes the child decay; the ſooner, as this chyle furniſhes only a bad nouriſhment.

V. Laſtly, bilious milk heats, and diſorders the children; occaſions bilious looſeneſſes, with ſhooting pains; cauſes an itching, with miliary and tetterous eruptions; and excites, in the blood, a feveriſh motion, which dries up, and decays the children.

## DIAGNOSTIC.

It is eaſy to know the bad qualities of the milk in nurſes.

I. It is apparent to the ſight, whether the milk be too ſerous or thick: but, to judge of it the better, ſome drops of it may be put on the ſurface of a looking-glaſs, or a plate of dutch-ware. If, by raiſing ſoftly the glaſs or plate, the milk flows like water, it

it is too ſerous. On the contrary, it is too thick, if it adhere ſtrongly; and only flows when the glaſs, or plate, is put in an almoſt perpendicular ſituation. It is of a proper conſiſtence, when it keeps in a middle ſtate, between the two extremes; and does not flow ſo eaſily as ſerous milk, but more eaſily than ſuch as is thick.

II. III. IV. V. It may be known, when the milk is ſaline and acrid, bilious and bitter, by taſting it. But in order to be more certain, ſome drops of it may be put into the eye at the great angle on the ſide of the noſe, and by moving the eye-lid it is extended on the globe of the eye. When it makes no impreſſion there, the milk is ſweet, as it ought to be; but when it cauſes a ſmarting, it may reaſonably be concluded to be ſaline, acid, or bilious; and theſe faults are the greater, in proportion as the ſmart is more lively.

It may particularly be known if it be aceſcent, by putting a ſpoonful of it to coffee, that has been expoſed to the heat of a burning coal. If the milk curdles, it is a proof that it was aceſcent.

It may be certainly known if the milk be bilious, even by dipping into it a piece of white linen, and afterwards drying it. When, it may be concluded the milk is bilious, if the linen appear yellow; and more or leſs bilious, as the linen is more or leſs yellow.

All theſe bad qualities of the milk are generally in nurſes who become pregnant, and continue to ſuckle their child. I believe they may be attributed to odd likings women have in the beginning of pregnancy; and which occaſion them to eat a great quantity of bad aliments.

After all, the ſtate of the child is the beſt proof of the quality of the milk. If the child be well; if it be plump and its ſtools appear right, the milk it takes is good. But there is reaſon to believe it to be bad, when the child grows thin, and waſtes without any appe-

apparent cauſe: as in that caſe, the nature of its diſorders, and ſtate of its ſtools, leave room to conjecture, that this ariſes from the bad quality of the nurſe's milk.

## PROGNOSTIC.

As it is material to the health of the child, to have a nurſe whoſe milk is good, there is reaſon for concern when it is apprehended the nurſe's milk is bad; and there is greater or leſs occaſion for this, according to the quality of the milk.

I. The ſerous milk is commonly good. It is generally nouriſhing enough for children to the age of nine or ten months; and it conduces to their breeding their teeth well. After that age, every thing wanting, as to nouriſhment, may be ſupplied by ſpoon-meat with great ſafety: on which account, unleſs the milk be extremely ſerous, or the child have an obſtinate looſeneſs, this quality of the milk ſhould not determine the exchanging the nurſe.

II. III. IV. V. Thick, ſaline, ſour, bitter, and bilious milk, is naturally unwholeſome. However little the child may appear to be diſordered thence, it is proper to procure another nurſe for it, without delay. It is to be obſerved, that thick milk is the worſt of all; particularly for very young children, whoſe ſtomachs are not ſtrong enough to digeſt it. But children who are ten or twelve months old, are leſs diſordered by it.

## METHOD OF CURE.

The care which ſhould moſt engroſs the attention, where nurſes have bad milk, is, to endeavour to correct the faultineſs by remedies or *regimen*.

I. If the milk be too ſerous, it is proper to forbid the nurſe fruit and freſh roots. She ſhould uſe a more nutritious diet; as ſoop, broth, rice, gruel, and

eggs: be ſparing in the quantity of water ſhe drinks; and take a little wine: and only give milk at moderate intervals; that the lymphatic veſſels, which ariſe from the mammary body, may have time to abſorb a part of the lymph, that abounds in the milk; and renders it too ſerous.

II. On the contrary, if the milk be too thick, there ſhould be given, to the nurſe, only ſlight aliments; in general, but little fleſh; much freſh vegetables of a diſſolvent nature, ſimply ſeaſoned; and even fruits, provided they be ripe. The uſe of wine ſhould be prohibited; and ſhe ſhould be adviſed to drink much water, and often give ſuck; in order that the milk may not have time to grow ſtill thicker, in the breaſt.

III. If the milk be acrid and ſaline, attention ſhould be had, that the food of the nurſe be very little ſalted. All ſorts of ragouts ſhould be forbid; as well as ſmoked and ſalted meat. She ſhould be allowed the uſe of vegetables, very ſimply ſeaſoned; and even ripe diſſolvent fruits. Laſtly, there ſhould be given to her, in the night, one or two glaſſes of weak lemonade.

IV. If the milk be diſpoſed to be acid, all uſe of vegetables ſhould be forbid, as well as fruits, curds, ſalads, wine and milk meats. The women ſhould be ſuffered to eat but little meat: but ſoup, rice gruel, and broth, may be allowed them. They ſhould be made to take, every day, two hours before dinner, half a dram of the bark in powder.

V. If the milk be bilious, the women ſhould be purged with a gentle cathartic. They ſhould be made to take broth, made of half a pound of veal, in which ſhould be boiled, the leaves of wild chicory, agrimony, pimpernel, and water-creſſes; and thirty grains of *terra foliata tartari*, diſſolved in it, when it is ſtrained. Laſtly, they ſhould be given in the morning, faſting, after the broth is taken, two grains of rhubarb, mixt with a little *confectio hyacinthi*.

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If theſe remedies and *regimen* appear to correct the bad qualities of the milk, and the child regain its former ſtate, the ſame nurſe may be continued. But it is not ſo proper, to truſt intirely to theſe appearances. It is generally the beſt method to change the nurſe; and the ſame holds good, when there is a ſtrong preſumption that ſhe is with child.

End of the DISEASES of WOMEN.

# DISSERTATIONS

ON

# SEVERAL PASSAGES

IN THE

# TREATISE

ON THE

# Diſeaſes of Women:

In which it is endeavoured to remove ſome Doubts, which have ariſen reſpecting them.

# I. DISSERTATION.

*In which it is endeavoured, to clear up the doubts of M. Van Swieten on the ſtructure of the* uterus, *as explained in the firſt volume of this work.*

MR. Van Swieten, firſt phyſician to the Emperor, and Empreſs Queen, known to the world, by an excellent Commentary on Boerhaave's Aphoriſms, which forms a complete ſyſtem of phyſic, did me the honour to ſpeak of this work, in his fourth volume, on the ſubject of the periodical returns of the *menſes*; and, on that occaſion, beſtowed ſuch commendations on me, as could not fail to flatter me. For nothing is ſo pleaſing, as to be praiſed by a perſon, who is himſelf praiſeworthy; *laudari à laudato viro:* an honour I am very deſirous to merit. But I know myſelf too well, *mecum habito*, not to judge how much I owe, in this reſpect, to the politeneſs of this learned Phyſician.

After having ſaid, that the explanation of the œconomy of the *menſes*, which I gave, is very ingenious, he adds, with a delicacy that does him honour, and for which my thanks are due, that he believes, he ought to ſuſpend his aſſent: becauſe * this explanation

* Sic celeberrimus Aſtruc, qui recentiſſimè de hac reſcripſit, eamdem ſententiam amplectitur, *ſcilicet menſtruationem a plethorâ particulari dependere*, licet alio modo explicet, & credat ſanguinem menſtruum ex uteri venis prodire, per quaſdam appendices venoſas, quas *Cæcales* vocat, quæ in extremis ſuis corrugatæ ſanguini viam occludunt, tempore verò menſtrui fluoris ab urgente ſanguini accumulato in uteri-

tion ſuppoſes, in the ſtructure of the *uterus*, a conformation, which does not appear ſufficiently demonſtrated by anatomy.

I have ſaid nothing new, on the ſtructure of the *uterus*, in the firſt chapter of the firſt volume of this work, but the two following facts: *The one*, that between the internal and muſcular coats of the *uterus*, a great number of vermicular or lactiferous veſſels are found, entwined round the blood-veſſels; which, after being united, ſeveral together, enter the internal coat of the *uterus*; and diſembogue into its cavity, by apertures common to every knot, the milk they have ſecreted. *The other*, that there are, between the ſame coats of the *uterus*, a great number of cœcal veins, or veinous *appendices*; which riſe from different ramifications of the uterine veins; particularly, from places where they anaſtomatize together; and, proceeding directly towards the exterior part of the *uterus*, enter the nervous coat, with which it is covered.

Theſe *appendices*, or ends of the veins, terminate in the *uterus*, at the internal ſurface, and are cloſed up; but they elongate, project a little into the *uterus*, and open in the time of menſtruation. They elongate and project ſtill more in the time of pregnancy; as well as during the red *lochia*, which follow delivery. Hence comes the blood of the *menſes*; that diſcharged for the nouriſhment of the *fœtus*; and, laſtly, that of the red *lochia*, in the firſt days of child-bed.

It is with reſpect to one or other of theſe facts, the doubts of M. Van Swieten muſt lie; but there is not any appearance, that they regard the exiſtence of

nis vaſis aperiuntur & ſanguinem dimittunt. Quamvis valde ingenioſa & hæc explicatio videatur liceat mihi, pace tanti viri, (ex cujus eruditiſſimis ſcriptis me plurima didiciſſe gratus recordor) ſuſpendere judicium, cum aliqua ſaltem ſupponat in uteri fabricâ, quæ nondùm videntur anatomicè ſatis demonſtrata. *Tom.* IV. *Commentar. in Hermanni Boerhaave Aphoriſmos, pag.* 404.

the

the vermicular or lactiferous veſſels. Theſe veſſels are plainly viſible in the uteruſſes of all quadrupeds; provided the examination be made near the time of their delivery. I have conſtantly found them in the uteruſſes of cows, ſheep, goats, bitches, cats, *&c.* and I do not doubt but that ſeveral anatomiſts have obſerved the ſame. However, it is very certain, that Ruyſch has ſeen and deſcribed them, *Theſaur. Anatomic.* II. *N.* XIX. and *Theſaur. Anatomic.* VII. *N.* XVI. *not.* 1. *&* 2. and that they were a long time before pointed out by Gautier Charleton, *De cauſis catameniorum, pag. m.* 27. Beſides, it is neceſſary to aſſign a ſource for the milk, which women diſcharge in the milky *fluor albus*; that they furniſh for the nouriſhment of the *fœtus*; and that evacuated in the milky *lochia*, which ſucceed the red *lochia*. Now theſe vermicular or lactiferous veſſels in queſtion, may be a ſource of theſe diſcharges: and certainly are the real one.

It muſt, therefore, be concluded, that M. Van Swieten's doubts regard the reality of the cœcal veins or veinous *appendices:* and the manner in which he has ſpoken of them, in the paſſage I have quoted, evinces it. I am not ſurprized, he doubts the reality of the *appendices*. The opportunities of obſerving them are not common. They are only to be found in the uteruſſes of women; and in order to find them there, it is neceſſary to ſearch for them in the ninth month of pregnancy. The opportunities of opening women in theſe circumſtances are rare; and it is ſtill more rare, that thoſe, to whom theſe opportunities do occur, are qualified to reap the advantages of them. This is the reaſon, why there are no anatomiſts, who have mentioned them in the deſcriptions of the veſſels of the *uterus*; and their ſilence is very conducive to authorize the doubts, that are entertained on the exiſtence of theſe veins.

However, theſe veins have not been abſolutely unknown to all anatomiſts. There are ſeveral, who have

have obſerved, or at leaſt diſcovered them, without underſtanding the uſe of them. I did not omit, to quote ſome of them in Chap. III. of the firſt book of this work, in order to prevent the doubts that might be made on this fact: but I ſee my precaution was not ſufficient. I muſt, therefore, take the matter up again; treat this ſubject in a more detail manner; and inſert, at large, the paſſages of the authors I quote, to ſave the trouble of having recourſe to them; which I ſhall do with pleaſure, to ſatisfy the doubts of M. Van Swieten; and to endeavour to merit his approbation, of which I am ſenſible of the value.

In order to afford a deciſive view of this queſtion, I ſhall divide, into four articles, what I have to ſay. I. I ſhall mention what I have obſerved myſelf. II. I ſhall collect what I have found, on this ſubject, in the beſt ancient phyſicians, from the time of Hippocrates to the laſt century, when anatomy began to flouriſh. III. I ſhall relate what has been ſaid on the ſtructure of the *uterus*, by the moſt celebrated anatomiſts of the laſt and preſent ages. IV. I ſhall finiſh with ſome remarks; which will conclude, and I hope clear up and determine the queſtion.

## I.

In the time, when I applied myſelf with ardour to the ſtudy of anatomy, which is a long while ago, I had occaſion in a very ſhort ſpace, to open the bodies of two women: One, died at the end of nine months of her pregnancy; and the other, three or four days after delivery. As the firſt of theſe women was of a low rank, I had permiſſion to take away the *uterus*, to examine it with more convenience and attention; and I made a proper uſe of the opportunity.

After having opened it croſs-wiſe, in a part oppoſite to that where the *placenta* adhered; I made a way, without

without dividing the coverings of the *fœtus*, to the *placenta*; and I detached it gradually from the *uterus* to which it adhered. By ſeparating it, I ſaw the reciprocal inſertions of the *placenta*, and *uterus*, which were united: but I ſaw with more pleaſure ſtill, that, accordingly as I ſeparated the *placenta*, the ends of the veſſels, adhering to the *uterus*, unſheathed themſelves from its ſubſtance, appearing to be of the length of two or three lines: and ſome of them of the thickneſs of a moderate ſized gooſe quill; but others leſs. Though theſe veſſels have not any regularity in their inſertions, yet it is in the higheſt parts of the eminences, as I remarked in ſpeaking of the *placenta*, that they are moſtly found.

Having removed the *fœtus*, included in its coverings, of which I deferred the examination till another time, I applied myſelf, to diſcover the nature of the veſſels I had juſt obſerved, in order to know if they adhered to the arteries or veins of the *uterus*, and in what manner. To ſatisfy myſelf of this, I had nothing more to do, than to introduce probes into theſe veſſels; which the largeneſs of their orifice eaſily permitted. Theſe probes led me always to a ramification of ſome uterine veins, which are very large at this period of pregnancy; and almoſt always to places, where theſe ramifications unite by *anaſtomoſis*: and I made myſelf certain of this, by diſſecting theſe veſſels, to the veins where they end; and by diſengaging them from the membranes, and fibres, which cover them. Theſe veſſels riſe perpendicularly from uterine veins, as the lateral *appendices*, without interrupting the courſe of the circulation; which continues to go on in the length of the veins: ſo that they may be regarded as little *culs-de-ſac*, or ſhort cavities with the ends ſhut up; or, to make uſe of an expreſſion more applicable to the ſubject, as little *cæca*: which inclined me, to give them the name of *cæcal veins*, or *veinous appendices*.

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Although I had not, after these observations, any doubt respecting the communication of these cœcal veins with the uterine, I was very desirous to satisfy myself of it by injections. I made them, therefore, in different ramifications of the uterine veins; and the fluid of these injections came out, with a full stream, at the ends of the cœcal veins, which appertained to these ramifications. The success was the same, when I made the same injections in some of the cœcal veins: and the fluid issued with the like facility from the ramifications of the veins of the *uterus*, from whence these cœcal veins take their rise.

The remainder of these cœcal veins all come from uterine veins, and there is not any that belong to the arteries; the distribution of which in the *uterus*, is absolutely the same, as in other parts of the body. This observation is of importance: because it will be seen, hereafter, that many anatomists have admitted a double communication between the *uterus* and *placenta*; one, by the arteries; and the other, by the veins; in which they are mistaken.

I had an opportunity, some time after, of repeating the same observations on the *uterus* of another woman, who died the fourteenth day after delivery; and I found there the same conformation, as to all that was essential. It is true, that, as the *uterus* was begun to be contracted, the cœcal veins were shortened, and narrow in proportion; but they were still large enough to receive a probe; and to admit of injections being made in them: that is to say, of repeating what I had before done on the first *uterus*, and the success was absolutely the same. I ought not to omit, that in the uteruses of these two women, I observed, between the internal and muscular coats, a great number of vermicular vessels, full of milk, that was easily pressed from them, and discharged into the *uterus* by different apertures, with which the internal coat was pierced; and which were visible.

From

From what we have ſaid, it muſt be inferred, that the length and thickneſs of the cœcal veins, or veinous *appendices*, muſt vary, according to the different ſtates of the *uterus*. In adult girls, if they be not in the actual time of their *menſes*, theſe veins are very ſmall, ſhort, and do not project into the *uterus*; in which their ends are folded, cloſed up, and cannot then be diſtinguiſhed. In the time of their *menſes*, they grow bigger; elongate; project into the *uterus*; and, opening, diſcharge into it the blood of the *menſes*: and ſome anatomiſts have diſtinguiſhed them in this ſtate. They become ſtill longer and longer in the time of pregnancy; projecting more than before into the *uterus*; and inſinuating into the *placenta*, where they ſheathe themſelves, and diſcharge the blood deſtined to the nouriſhment of the *fœtus*: and whoever is ſo fortunate as to ſee them in this ſtate, cannot well miſtake them. Theſe veins remain in this condition ſome time after delivery; and then the blood continues to flow from them copiouſly; which occaſions the *lochia*. But at length, ſome days after, they contract, ſhorten, and cloſe themſelves, accordingly as the *uterus* contracts; at which time, the *lochia* ceaſes.

This is the ſubſtance of my remarks: I do not know what degree of belief it may be favoured with; but I beg it may be conſidered, that the obſervations are not nice nor microſcopic, ſuch as thoſe in which the imagination of the obſerver often furniſhes much to the reality. They are made on a ſubject where the examination may be by the naked eye; where a certainty of all the facts may be obtained by injections, or the uſe of a probe; and where conſequently it is very difficult to be miſtaken. I hope ſome anatomiſts will have the curioſity to verify what I have advanced; and I wiſh it, provided when they make the obſervations, they will not let the ſubject be the uteruſſes of quadrupeds, in which theſe veſſels are not to be found, becauſe the females of theſe animals

animals have not red *menſes*; do not nouriſh their fœtuſſes with blood; and are not ſubject to the *lochia*: but that they would let it be women, who die at the end of their pregnancy, or a few days after their delivery.

## II.

The ſtudy of anatomy was but ill cultivated by the ancient phyſicians; and it muſt not be expected to find, in thoſe of their writings which remain with us, the deſcriptions of parts; and ſtill leſs ſuch as are accurate. But the little we know of their anatomical lights, may eaſily conſole us for what we have loſt. This reflection will give but little room to hope we may find, among them, explanations of the ſtructure of the *uterus*, and the diſtribution of its blood-veſſels. However, if attention be given to what may be found in their works, we ſhall agree, that they have had ideas, very analogous to thoſe we ourſelves have, on the blood-veſſels of the *uterus*; though they have imparted them very badly.

Hippocrates has * ſpoken of the *cotyledones* in the uteruſſes of women, without explaining what he meant by them. We learn from Galen †, that there were phyſicians who admitted of *cotyledones* only in the uteruſſes of cows, goats, and ewes; but denied that there were any in the uteruſſes of women. But Galen, who followed the ſentiments of Hippocrates, oppoſed the authority of ‡ Diocles of Caryſtus, in the iſland of Eubœa, now *Negropontus*, and of || Praxagoras of the iſland of Cos, who lived a

* *Aphor.* 45. *Sect.* V.

† De Diſſectione Vulvæ, *cap.* 10.

‡ Diocles was a celebrated phyſician. Galen ſays, that he wrote on Anatomy, *Lib.* II. *de Anatomic. adminiſtrat. Cap.* I. Et *Comment.* 2. *in Libr. de Naturâ humanâ.* He relates elſewhere, *Lib.* VI. *de Morbis vulgaribus, Comment.* II. *verſùs finem*, that Diocles compoſed a Treatiſe *de Morbis Mulierum.*

|| Galen praiſes Praxagoras in ſeveral places, as an Anatomiſt, particularly *Comment.* II. *in Libr. de Naturâ humanâ.*

little

little time after Hippocrates; and who, the same as several other physicians, admitted of *cotyledones* in the uteruſſes of women, during pregnancy; that is to ſay, "of perforated veins, which form eminences in "the *uterus*, nearly the ſame as the *hæmorrhoides* in "the *rectum*, which emit the blood for the nouriſh-"ment of the *fœtus*, and ſerve, in the mean time, "to ſtrengthen the adheſion of it." *Diocles Caryſtius*, ſays Galen, *& Praxagoras Cous Nicarchi filius, qui paulò poſt Hippocratis ætatem viguerunt, eadem dicunt, (id eſt,* cotyledones in fœminis adeſſe) *& multi etiam alii. Quid igitur, omnes-ne ignorarunt? Sed fas minimè eſt de tantis viris ita ſentire. Quid vero eſt quod dicunt? Ora vaſorum vulvæ ita appellant, nam hæc pregnationis tempore acetabulares quaſdam eminentias innatas habent, quales etiam recto inteſtino eſſe in hæmorrhoïdibus ſolent. Atque hæc non divino ego,* continues Galen, *ſed à Praxagora accepi, qui ita ad verbum ſcribit,* "Cotyledones autem ſunt venarum ora, "quæ in vulvam penetrant." Galen, ſpeaking of the ſame ſubject, has ſaid, a little higher, "That "theſe *cotyledones* emit the blood into the veſſels of "the chorion." *Oribus enim uniuntur, atque alterum ab altero, vena, inquam, à vena ſanguinem haurit.* And he adds a little lower, "that theſe *cotyledones* unite "the *chorion* to the *uterus*." *Adde quod Cotyledones etiam hoc modo firmum vinculum ad vulvam efficiuntur.*

In this paſſage, though a little perplexed, I can make out the cœcal veins, or veinous *appendices*; which I have ſeen in the uteruſſes of pregnant women, and of which I have given a deſcription: and I believe others will find out the ſame, if all the circumſtances be weighed.

This opinion, advanced by Hippocrates, ſupported with the expreſs approbation of two anatomiſts of repute; and kept up with all the authority of Galen, ſoon prevailed; and became the common opinion of every phyſician. So that I believe I may

diſpenſe

diſpenſe with ſeeking for other proofs of it in the writings of Greek and Latin phyſicians who have lived ſince the time of Galen to the fall of the Roman empire: becauſe it would be only repetition of what we have ſeen. The ſtudy of anatomy was not enough purſued, at that time, to furniſh the means of making new diſcoveries. I ſhall ſearch for it ſtill leſs in the works of the Arabian phyſicians, among whom medicine flouriſhed, when it declined among the Romans; becauſe they were not allowed to open dead bodies; their religion prohibiting it.

I ſhall not moreover dwell on the authors who have written from the beginning of the thirteenth century, at which time medicine began to flouriſh in Europe, to the revival of learning, towards the middle of the fifteenth century; becauſe I only find in them perplexed paſſages, only expreſſing badly, what we have already ſeen.

I ſhall paſs on, therefore, to thoſe authors who have written ſince the reſtoration of letters; in whom I find more method and preciſion; and whoſe real ſentiment may be underſtood.

Such is Nicholas de Roches, *Rochæus*, who printed at Paris, in 1542, in *duodecimo*, a Treatiſe on the Diſeaſes of Women, which has been inſerted in the collection of Wolphius, and Spachius. The firſt chapter of that work contains an anatomical detail of the ſtructure of the *uterus*, and its parts. This author ſays, "That the navel," that is to ſay, according to the language of that time, "the *placenta*, having "performed its functions, is ſeparated from the *aceta-* "*bulæ* or *cotyledones* of the *uterus*, as the ſtalk of a "ripe apple is ſeparated from the branch to which it "hangs;" adding, immediately after, that it is "from theſe *acetabulæ* the blood of the *menſes* is diſcharg'd," or, to ſpeak more properly, "the *lochia* which follow "delivery." *Umbilicus cum involucris, hoc eſt, ſecundis, functus officio, ab acetabulis abſcedit, veluti pomi pediculus jam maturi à ramo ſponte cadentis: Ex iis acetabulis*

*lis à partu menſtrua profluunt*; which, as appears, reſemble wholly the veinous *appendices*, that we admit to be in the *uterus*, and to which we attribute the ſame uſes. But this reſemblance may be ſtill better judged of, by another paſſage of the ſame chapter; in which De Roches mentions the uſe of the *cotyledones*, or *acetabulæ*. *Eſt matrix intus*, ſays he, *undique conſperſa tanquam punctis: ſunt autem hæc puncta orificia venarum undique tendentium ad matricem, & hæc orificia vocantur* Κοτυλησόνες. *Triplex utilitas eſt cotyledonum, ſunt enim canales, per quos ſanguis menſtruus effluit: ſuppeditam etiam ſanguinem puriorem alendæ matrici & alendo fœtui; & figurâ ſuâ fibras apprehendunt, ut retineri in utero fœtus poſſit.*

Such alſo is James Sylvius of Amiens, Doctor in Phyſic of the faculty of Montpellier, Profeſſor of the Royal College, an able anatomiſt, and known by ſeveral medicinal works, collected into one volume by Renè Moreau, Doctor Regent of the faculty of Paris. This phyſician ſeems to have taken pleaſure in repeating, in ſeveral parts of his work, that he thought very favourably of the *cotyledones* in the uteruſſes of women.

I. In the treatiſe, intitled *Iſagoge anatomica in libros Hippocratis & Galeni anatomicos*, *Libr.* III. *Chap.* XIII. *De utero*, Sylvius ſays, "That the *cotyledones* are "the mouths of blood-veſſels, which project into the "*uterus*: that they ſwell, like little hemorrhoi-"des, principally when the *fœtus* is large, or "the *menſes* are ready to appear, a little cavity re-"maining in the middle of their mouths; from "whence, as is moſt likely, the Greeks called "them *cotyle*: that it is by theſe *cotyledones* where "an union is made of the veſſels of the ſame "kind, the *chorion (placenta)* adheres to the *uterus*, "in pregnant women: and that the *fœtus* is nou-"riſhed, by the interpoſition of the *chorion*, with "the blood carried by the *cotyledones*." After which he exclaims ſtrongly againſt thoſe "who, in con-

tempt of the authority of Hippocrates and Galen, dare to assert, that there are no such *cotyledones* in the uteruſſes of women." *Cotyledones*, says he, *sunt ora vasorum, in uterum internum penetrantia, quæ præsertim grandiore jam fœtu, aut menstruis per hæc fluxuris intumescunt hæmorroïdum parvarum modo, servatâ scilicet in medio ipsorum orificiorum parvâ ceu cotyle & cavitate : per has utero prægnantis adhæret chorion, paribus suorum congenerum vasorum oribus ; tùm chorii interventu fœtus ; sicque in utero nutritur.* I declare that I can distinguish in this description, my veinous *appendices* ; and that I believe I could not give a better one of them myself. It is moreover proper to remark, that this description is given by an able anatomist ; and who appears to have observed them himself.

II. In the latter part of the book, of which we have spoken, Sylvius has added several observations, that he had made in the opening of dead bodies. He there mentions particularly one woman, who died in child-birth, and whom he opened. " The *ute-* " *rus*," says he, " was still of the bigness of a " man's head, and an inch thick : there was, in its " cavity, a little blood ; and the orifices of the ves- " sels overflowed with thick and black blood." *Uterus magnitudine capitis erat adhuc & crassitie pollicari : intus sanguinis reliquiæ, & ora vasorum crasso & nigro sanguine adhuc sudantia.* It is evident, that these vessels, still overflowing with a thick and black blood, were the mouths of the cœcal veins, already contracted ; but not yet closed ; and the same with the *puncta*, with which, as we have above seen, De Roches said the *uterus* is spread : and which are the orifices of the *cotyledones*.

III. I believe I must quote another passage of the same author, taken from a treatise written against Vesalius, intitled, *Vesalii cujusdam calumniarum in Hippocratis Galenique rem anatomicam depulsio* ; in which, Sylvius says, in the refutation of the twenty-eighth

eighth calumny, "That the *cotyledones* are very little "apparent in the uterusses of women, who are not "pregnant; and that they may be known by rea- "son, rather than by sight; but that in women who "lye-in, or who have been delivered a little time, the "orifices of these veins are very apparent: particu- "larly those of the veins, which when they are blown "up, are much larger than the arteries:" and he adds, just afterwards, "that if the *chorion* (meaning the *pla- "centa*) be gently separated from the proper coats "of the *uterus*, there will be seen to flow from the "vessels a kind of matter and a little blood;" which represents what I saw when I separated the *placenta* from the *uterus*. *Cotyledones uteri muliebris tam ob- scuræ sunt, ut visum effugiant, & ratione propemodùm magis quàm sensu usurpentur. Quanquam in muliere parturiente aut recens enixâ apertè spectantur hæc ora vasorum, præcipuè venarum, cùm hæ sint arteriis multò ampliores, si inanitæ inflentur. . . . . Imò cùm cho- rion* (placenta) *à propriâ uteri tunicâ elementer digitis diducitur, sanie quâdam & pauco sanguine fluere ea videbis.*

Sylvius speaks still the same of the *cotyledones*, in the beginning of the treatise *De menstruis mulierum, & hominis generatione*; but as he only repeats what we have seen already, I believe I may dispense with relating this passage: which may be seen in the au- thor's own work, if any be curious to inform them- selves of it.

Such is also *Johannes Gorræus*, Doctor Regent of the faculty of medicine of Paris, who composed a me- dicinal dictionary, of much esteem, printed at Paris, under the title of *Definitiorum Medicarum Libri* XXIV. *in folio*, in 1564. In this work, under the Greek words appropriated to medicine, and ranged in an alphabetical order, there is an accurate compilation of what is most useful in the writings of Hippo- crates, Galen, and of many other physicians. We find there, for example, under the word Κοτυληδόνες,

"that the *cotyledones* are the mouths of arteries and "veins, which project into the *uterus*, and seem to "make a knot very like the *hæmorroïdes* of the *anus*, "or the orbicular and concave leaves of the plant "called *umbiculus veneris*, or navel-wort. There is "in the middle of the orifice of the eminences, a "little cavity, not unlike the measure called *cotyle*. "That it is from these eminences the blood flows, "which comes out by the *menses*, or which fur-"nishes nutrition to the *fœtus*, in such manner, that "it only escapes when these vessels are open; and "ceases to flow when they are shut. That these "eminences serve to unite the *placenta* and *uterus* "so closely, that the extremities of the uterine "vessels insinuating themselves into the *placenta*, "and adhering there, make it seem as if the vessels "of the *uterus*, and those of the *placenta*, were the "same. Lastly, that these eminences serve to form so "strong a cohesion between the after-birth and "*uterus*, that it is difficult for the *fœtus* to disengage "itself." Κοτυληδόνες *sunt ora venarum & arteriarum intra uterum eminentia, & quodammodo nodosa, non multùm ab hæmorrhoïdibus ani dissimilia, aut* τῆς κοτυληδόνος *herbæ foliis orbiculatis & parum concavis; servatur namque in medio ipsorum orificiorum parva cavitas in cotyles modum. Per hæc sanguis menstruus vel vacuatur foras, vel in fœtum nutriendum transumitur, si quidem apertis his effluit, sicut conniventibus supprimitur. His etiam orificiis fœtuum secundæ utero inhærescunt, vasorum uteri finibus in secundas subeuntibus atque illigantibus, ut eadem prorsus uteri & secundarum vasa esse videantur . . . . . Nec verò id tantùm ea vasa præstant, sed etiam secundas utero ita colligant, ut fœtus haud temerè excidat.*

Although these authorities appear decisive, I believe, I should still add those of two anatomists of later date; but who have retained the language of the ancients.

The

The firſt is Thomas Bartholin, a Dane, who after having taken his degrees at Baſil, in 1645, was, the year after his return into Denmark, appointed Profeſſor of medicine at Copenhagen; and appointed to teach anatomy. He acquitted himſelf of this employment with reputation. He ſays, in a treatiſe on anatomy,* of which, the third edition was printed at the Hague, in 1651, *in octavo*, *Horum vaſorum* (uterinorum) *aut tubulorum potiùs oſcula cavitatem fundi ſubeunt, quæ acetabula dicuntur, item cotyledones, qui hiant & aperiuntur, cùm menſtrua purgantur, & in gravidis ubi hepar uterinum iis jungitur . . . . . ſanguinem hauriens pro fœtu.*

The other is Iſbrand Diemerbroëck, Profeſſor of phyſic and anatomy in the univerſity of Utrecht: who, in a treatiſe *De Anatome corporis humani*, printed at Utrecht, *in quarto*, in 1672, expreſſes himſelf thus, *Lib.* I. *Cap.* 24. *Subeunt arteriæ ſinibus ſeu oſculis uteri ſubſtantiam, in quam ſanguinem effundunt, qui in eâ quaquaverſum diſtribuitur per anfractuoſos canales & tubulos (hos nonnulli acetabula & cotyledones eſſe putârunt) quibus in conceptione hepar uterinum adheret, in quod tunc temporis hiant, eique ſanguinem pro nutritione fœtus præparandum infundunt . . . . . Extra impræ-gnationem verò, qui ſingulis menſibus redundat ſanguis, ſtatis periodis . . . . . per dehiſcentia et aperta tubulorum orificia . . . . . ut ſupervacuus et Naturæ ſuâ copiâ moleſtus foras effluat.*

Theſe are, I think, ſufficient authorities to prove, that, from the time of Hippocrates to the laſt century, it was commonly believed, there were, in the uteruſſes of women, veſſels that projected into their cavity; which, when the women were not pregnant, emit every month, by opening, the blood of the *menſes*: and which, in thoſe who are pregnant, by elongating, inſinuate themſelves into the *placenta*; which they affix ſtrongly to the *uterus*; and diſembogue the blood into it for the nouriſhment of the



* *Libro* I. *Cap.* 28. *pag. m.* 166.

*fœtus*. Theſe veſſels muſt be acknowledged, I believe, to be the veinous *appendices*, or cœcal veins, that I admit; and which only ſeem here to want the name. I do not quote theſe authors, as witneſſes of the reality of the veſſels, of which they have ſpoken; for I doubt they have not obſerved them in ſubjects, which they have diſſected; and am afraid they have only ſeen them in Galen, whom they have copied. I except from this number Sylvius, who was an anatomiſt accuſtomed to open dead bodies; and who ſeems to have obſerved the greateſt part of the facts he relates. In the following article, will be ſeen more certain and concluſive obſervations, taken from anatomiſts, who wrote about 150 years ago. Not that they knew better theſe veinous *appendices*, or cœcal veins, of which they ſpoke: but they relate ſeveral facts, they have ſeen in diſſections made by them; facts, which infer theſe veinous *appendices*, and relate to them; and which could not have been ſeen, if they had not been real: in a word, facts, which demonſtrate theſe *appendices*.

## III.

In proportion as anatomy was neglected by the ancient phyſicians, it has been cultivated by thoſe of the two laſt centuries. It is to this ardour we owe the exact deſcriptions of the parts of the body; the knowledge of their ſtructure; their functions; the different veſſels, that are diſtributed or riſe in it: in ſhort, all the progreſs, anatomical ſcience has made. Though they have almoſt all treated of the ſtructure of the *uterus*; and ſeveral have given important elucidations on this matter; we muſt not ſearch in their works for expreſs evidence of the veinous *appendices*, ſuch as I admit. They did not know them: but, as we have above ſaid, ſuch facts at leaſt are found in their works, as indicate theſe *appendices*; from whence it is eaſy to conclude, they exiſt; and that they could

could not fail to have been diſtinguiſhed, and known, if the enquiries after them had been carried a little further.

From theſe facts, I conceive, I may draw great advantage, in eſtabliſhing what I advance on the veinous *appendices*, or cœcal veins, which I have obſerved in the uteruſſes of women; and it is in this view, I have taken the trouble to collect them. As theſe facts relate to two points, I ſhall ſeparate them into two claſſes. I ſhall refer to each, the authors, who have ſeen and atteſted them; and, to ſpare my readers the trouble of verifying them, I ſhall cite the authors own expreſſions, as I have done in the laſt article.

*Firſt Claſs.* In women who die during the time of their *menſes*, the internal ſurface of the *uterus* is found, as it were, frized, with a great number of veins which project from it, and which can ſcarcely ever be diſtinguiſhed at other times.

Nathaniel Highmore, an Engliſh phyſician, firſt affirmed this fact in a treatiſe of anatomy, intitled, *Corporis humani Diſquiſitio anatomica*, which he publiſhed in 1652. He ſays there, *Lib.* I. *Part.* IV. *Cap.* IV. *Interna* (uteri membrana) *aſpera eſt à venarum prominentibus orificiis, præcipuè in menſtruatis, aliter vix conſpicuis.* He adds, ſome lines lower, *à ſpermaticis* (vaſis) *furculi fundum uteri petentes per illum diſſeminantur, et in cavitatem ejus penetrant, quibus in non gravidis, ſanguis menſtruus expurgatur, et aſperitates illas efficiunt per extuberantia ora, quæ à veteribus* Κοτυληδόνες *appellantur.* Graaf, who quotes that paſſage of Highmore *De mulierum organis generationi inſervientibus*, found nothing which could render that obſervation ſuſpicious. It is true, indeed, that Morgagni aſſerts *Adverſ. anatomic.* IV. *pag.* 24. he has not obſerved, that the uteruſſes of women, who die during the time of their *menſes*, was frized, with ſuch veſſels. But as the interior ſurface of the *uterus* varies in the *menſes*, according to the time, or

abundance of the discharge, Highmore might have seen in them what he has observed; which Morgagni did not find in those, he had occasion to examine.

Frederic Ruysch, a physician in Holland, and an anatomist of great reputation, has composed, besides several other works on anatomy, six dissertations, under the title of *Thesauri anatomici*, in which he relates a great number of observations made on dead bodies. In the VI. of these *Thesaur.* N° XXXII. *Not.* 2. he says, that he "observed, in a woman, "who died in the beginning of her pregnancy, the "interior surface of the *uterus* was unequal and pi-"lous, which he affirms to have found always the "same in other women;" and would have found, without doubt, in a more evident manner, if the pregnancy had been farther advanced. *In muliere quâdam*, says he, *à paucis diebus gravidâ uteri cavitas villosa & inæqualis; uti semper in aliis observavi.*

Jacobus Benignus Winslow, a Dane, Doctor Regent of the faculty of Paris, and a celebrated anatomist, relates, in his *Exposition anatomique de la structure du corps humain*, *pag.* 574. in a *quarto* edition, "that the internal coat of the *uterus* is some-"times furnished with very fine little hairs, and "pilous, as in women who die in the time of their "*menses*; and that these hairs are then red and full "of blood." I suspect this anatomist has made these hairs too fine; or, at least, that the woman, whose *uterus* he observed, was not at the end of her *menses*, or had them not copiously.

*Second Class.* The internal coat of the *uterus*, particularly, towards the *fundus*, is found pierced, in women who die while their *menses* are on them, with a great number of holes, very easy to be distinguished in that state. This is a very important fact; and well attested.

Adrian Spigelius of Brussels, Professor of anatomy in the university of Padua; and esteemed, in his time,

time, as an able anatomiſt, has compoſed a treatiſe of anatomy, *in folio*, under the title *De humani corporis fabricâ Libri decem*, which was printed at Venice, in 1627, two years after his death. In this work, Book VIII. Chap. XIX. the author ſays, that "the internal coat of "the *uterus* is full of little holes, particularly in the "*fundus*, at the place where the *uterus* lies over the "*rectum*. Theſe holes, *continues he*, are difficult to "be perceived, when a woman has not actually "the *menſes*; but when ſhe has, they become very "viſible: becauſe it is thence the menſtrual blood "is diſcharged. The ancients believed, that theſe "holes were the mouths of the veins and arteries: "and they called them . . . *cotyledones*." In the following chapter XXI. he adds, "that theſe *cotyledones* "are pierced in the *uterus*; and that the veſſels of "the *placenta* are united with them." *Interna verò* (uteri tunica) *plena meatibus exiguis, maximè ſub fundo eâ ſede, qua uterus tegit inteſtinum rectum. Meatus hi, ubi mulier à menſtruis purgationibus vacat, vix conſpicui ſunt, quo tempore verò laborat, evidentes fiunt, quippe cùm per hos purgetur menſtruus ſanguis ex corpore. Hos veteres venarum arteriarumque ora crediderunt & . . . . .* Κοτυληδόνες *appellaverunt*. Et capite ſequenti XXI. *Cotyledones in uterum pertuſi ſunt, quibuſcum placentæ carneæ vaſa cohærent.*

Francis Mauriceau, ſurgeon of the community of Saint Côme, and an *accoucheur* of great experience, relates in the *Traité anatomique des parties de la femme, qui ſervent à la génération*; which is at the head of his *Traité des Maladies des Femmes groſſes*, printed in 1682, Chap. X. "That, in the diſſection of a wo-"man, who had been hanged as a convict . . . . in "the time when ſhe actually had her *menſes*." . . . . "he ſaw plainly, all the cavity of the *fundus* of the "*uterus* ſpread with little grumes of coagulated "blood. . . . . and its veſſels all full of this blood "towards the orifices; which was diſcharged into "the *fundus* of the *uterus*.

Alexis

Alexis Littre, Doctor Regent of the faculty of medicine at Paris, member of the Academy of Sciences, a very able anatomiſt, aſſerts, in the Memoirs of the Academy, for the year 1701, page 293, "That, "in the body of a woman, who died ſuddenly from "a fall, in the eighth month of her pregnancy, the "parts of the *uterus*, principally thoſe to which the "*placenta* adhered, were eight lines thick: that "they were all carnous, and the inſide of their ſub-"ſtance, as well as their interior ſurface, were full "of holes, of a round or oval figure, from half a "line to two lines wide, and which had all a com-"munication with each other; becauſe, by blow-"ing into any one of them, the wind paſſed in-"to the others, and raiſed all the body of the "*uterus*."

The ſame author ſays elſewhere, *Hiſtoire de l'Académie des Sciences, année* 1720, *pag.* 16, that "according "to the obſervations, he made on ſeveral women dead "in the time of their *menſes*, the *uterus* is then large "and diſtended; that its blood-veſſels overflow "with blood, and emit it into its cavity: that the "internal ſurface is all overſpread with very viſible "holes, and full of a blood not unlike the arterial; "and that, by preſſing the body of the *uterus* on "both ſides, the blood is made to iſſue from all "theſe holes."

John Mery, ſurgeon of the community of Saint Côme, member of the Academy of Sciences, and a good anatomiſt, relates, in the *Hiſtoire de l'Academie, année* 1706, *pag.* 22, "that he made the following "obſervations on the *uterus* of a woman, who died "four hours after being delivered. 1° That the "body of that *uterus* was muſcular. 2° That it was "eight lines in thickneſs. 3° That its interior ſur-"face was not covered with any membrane. 4° "That it had no glands. 5° That the mouths of "the blood-veſſels in it, were evidently open.

"This

This laſt obſervation is very material to the deciſion of the queſtion, we treat of.

John Baptiſt Morgagni, a celebrated profeſſor of anatomy in the univerſity of Padua, mentions ſome very important anatomical obſervations. " I. In " ſpeaking of the ſource of the menſtrual blood,* " he aſſerts, that, having had occaſion to open a " girl, who died while ſhe had the *menſes*; and ſome " other women who had them, or who were near " having them at the time when they died; he firſt " wiped away the blood, which was as well in the " *vagina*, as the neck and *fundus* of the *uterus*: that " he could obſerve nothing in the *vagina* nor neck " of the *uterus*, which ſhewed the blood had been " diſcharged thence: whereas he ſaw the *fundus* of the " *uterus* covered with bloody ſpots, from whence he " eaſily preſt out drops of blood, with a ſmall force; " which led him to conclude, the blood of the *menſes* " comes from thence." *Cùm enim Virginis, quæ menſtruo ſanguine profluente interierat, itemque unius & alterius Mulieris, quibus is fluxus, paulò ante obitum aut fuiſſe, aut certè inſtitiſſe videbatur, genitalia annexaſque partes annis ſuperioribus diſſecuerim, poſtquam illum qui utero, vaginæque inhærebat, ſanguinem, ichoremque ſanguineum ablui atque abſtergi juſſiſſem, hæc ſedulâ inſpectione obſervavi. Neque in vaginâ, neque in cervice quidem erat, quod cruorem ex earum parietibus prodiiſſe ſignificaret. Contrà autem univerſum uteri fundum . . . ſanguineis undique maculis diſtinguebatur, ex quibus maculis vel mediocri expreſſione cruentas guttas elicere nihil prorsùs negotii erat . . . . ut facilè intelligeres ea loca ſcaturigines & fontes eſſe, undè vis cruoris ſtatis temporibus profunderetur.*

II. In another place, the ſame author ſays, ‡ " That he found in a woman, who died in child-" bed, veſſels in the *uterus*, ſufficiently dilated to " admit of the introduction of a finger; with which " ſinuſſes communicated, that opened into the *uterus*,

* Adverſaria anatom. *pag.* 46. ‡ Adverſ. anatom. IV. *pag.* 48.

" *rus*, by very large orifices ; particularly, in the " place, where the *placenta* ſtill adhered ; from " whence he concluded, there was no room for " ſurprize, that Graaf, by blowing into the uterine " veſſels, had made the air paſs into the cavity of " the *uterus* ; which he adds, Mr. *Fanton*, a " learned phyſician of Turin, had obſerved. It is " not leſs uſeful than curious, *ſays Mr. Fanton*, " (which Heiſter has borrowed from him) to ob- " ſerve, that one may, by blowing into the veins " of the *uterus*, make the air paſs into its cavity ; and " into that of the *vagina* ; and even ſometimes into " the veins, by blowing into the holes, which were " in the *uterus*, even in women who do not die in " delivery." *Nos enim . . . . . in puerperâ cùm externa uteri vaſa digitum craſſa invenerimus : communicantes autem cum his memoratos ſinus minimum alicubi digitum admittentes viderimus : tum foramina cum his communicantia in uteri ſuperficie, quâ adhuc placentæ pars adhærebat, . . . . eâ magnitudine deprehendimus, ut in maxima eorum apex minimi digiti nullo negotio immitti poſſet, . . . . Itaque minimè profectò mirum eſt, quod ſcripſit Graafius * humorem aut flatum per vaſa immiſſum intra puerperarum uterum perveniſſe . . . Illud verò quod perſæpè obſervavit † ſolertiſſimus Fantonus, utile*, velut ipſe inquit, *non minùs quàm curioſum eſt advertere, (& ſanè ex ipſo afferre non omiſit Heiſterus) per venas uteri aërem in ejus caveam, & vaginæ, atque aliquandò etiam contrà, & in iis quidem quæ non ſunt puerperæ, impelli poſſe.*

Laſtly, Jacobus Benignus Winſlow, whoſe teſtimony we have already quoted on the other fact, ſays, in his *Expoſition anatomique de la ſtructure du corps humain*, page 574 of the *quarto* edition, *col* 2. " That a part of the internal ſurface of the *uterus*, " which covers the *fundus*, is pierced with a quan- " tity of very viſible holes : from which, by preſſ- ing

* De mulierum organis generationi inſervientibus, *Cap. de utero.*

† Anatom. Differt. 9. Compend. Anatomic. n. 192.

"ing the body of the *uterus*, little drops of blood "are made to iſſue." He adds, "that theſe holes "are, more or leſs, red, and tinged with blood, in "thoſe who die in the time of their *menſes*."

Such are the facts, which I have collected from the moſt celebrated modern anatomiſts. I am not diſpoſed to make any commentary on them; becauſe it appears to me, they are ſufficiently clear, and convictive; and that, on the leaſt attention to them, the following concluſion may be drawn.

I. That the veſſels which Highmore found to render the *uterus* frized, in a woman who died while ſhe had the *menſes*, were the veinous *appendices*, or cœcal veins, then tumefied, and elongated into the cavity of the *uterus*.

That the ſame judgment might be paſſed on the red hairs full of blood, which appeared to Winſlow in the ſame circumſtances, and made it pilous: as alſo thoſe inequalities, that Ruyſch obſerved there, and which gave riſe to his ſaying the *uterus* was then *villoſa*. But it muſt be allowed that theſe two anatomiſts give very ſlight accounts of the ſtate of the *uterus*: at leaſt unleſs we ſuppoſe, they have made their obſervations on the uteruſſes of women, who had naturally the *menſes* very ſparingly; or that the diſcharge of the *menſes* had begun to ceaſe, when they made them.

II. That the palpably viſible holes, full of blood, which Spigelius, Mauriceau, Littre, Mery, Morgagni, and Winſlow all ſaw, on the internal ſurface of the uteruſſes, in women who died while they had the *menſes*, from whence the blood ſtill flowed; and from whence, in every caſe, it was eaſy to be preſt out; were evidently the mouths ſtill open of the veinous *appendices* or cœcal veins, already ſhortened, and become even with the internal coat of the *uterus*. Theſe are the ſame holes with which De Roches ſays, the internal ſurface of the *uterus* is ſpread; the little canals, *meatus exigui*, with which,

Spi-

Spigelius asserts, the internal surface of the *uterus* is peirced; and the *foramina nigro & spisso sanguine sudantia*, that Jacobus Sylvius had observed in the *uterus* of a dead woman, some days after being delivered.

III. That the facility which Graaf, Fanton, and Morgagni found, in making pass wind, and injections, from the uterine veins, into the cavity of the *uterus* of women who died in delivery; and even sometimes in those who were not delivered; or even from the holes, with which the internal coat of the *uterus* is pierced, into the uterine veins; proves, that these holes of the *uterus*, by which such wind and injections pass, are so many mouths of the ramifications of veins; or, to employ the true term, so many veinous *appendices*, or cœcal veins; which furnishes an evident proof of what we advance.

IV. Lastly, it is certain, that the anatomists, whom we have quoted, have, as I may say, seen and touched the *appendices:* and, in order to have made a description of them, they had only occasion to introduce a probe into some one of these holes, that they saw in the interior surface of the *uterus*, to distinguish where they ended; but none of them thought of doing it. It has been the fate of the greatest part of the discoveries in anatomy, such as the circulation of the blood, the thoracic duct, and the lymphatic veins, to have been a long time seen before they were understood and confirmed. At present, now the first step is taken, and the way pointed out, I hope it will be strenuously endeavoured, to verify what I declare to have observed; and that new observations will confirm mine. But it is necessary to mention, that they must be made on the uterusses of women. For nothing relative to it can be found in those of brutes: because their fœtusses are not nourished with blood, as has been said before, page 398.

In waiting for these new proofs, we are nevertheless persuaded, that what we have alledged, is very con-

concluſive and deciſive; and hope, that it will appear the more ſo, if the remarks be well attended to, that will be made in the following article.

## IV.

I. It is certain, that, from the interior ſurface of the *uterus*, the blood iſſues, which flows into its cavity in the time of the *menſes*, and of the *lochia* after delivery. It is likewiſe certain, that it flows into the ſubſtance of the *placenta*, from the ſecond month of pregnancy, to ſerve for the nouriſhment of the *fœtus*. The two firſt facts are evident; and the third is proved by the blood, which is diſcharged, when the *placenta* is ſeparated from the *uterus* in miſcarriages, and delivery.

II. The blood, which is diſcharged on theſe occaſions, is truly veinous. Its colour and conſiſtence will ſufficiently evince it; and it is moreover proved, by the flowneſs with which the blood of the *menſes* is diſcharged. If, nevertheleſs, the *lochia* be more abundant; it is not becauſe they flow more quickly, but becauſe they flow from larger openings.

III. This blood, which comes from the veins of the *uterus*, in the time of the *menſes* and pregnancy, may do it in one of theſe two manners: either becauſe there are ſome branches of veins, which are torn *per rixim*; or becauſe there are branches, which terminate at the internal ſurface of the *uterus*; of which the mouths are naturally folded, and ſhut: but which occaſionally dilate and open *per anaſtomoſim*. The firſt way cannot be admitted: it would be to ſuppoſe, that, every month, fiſſures and lacerations were made in the *uterus*: which continued five or ſix days; that, likewiſe, there were ſtill larger made in pregnancy, which continued ſix or ſeven months conſtantly; and which would conſequently expoſe the *uterus* to the inevitable danger of being ulcerated in a fatal manner. The danger is well known,

that

that ariſes when, in ſpittings of blood, the ſlight lacerations of the lungs, are long before they cicatriſe.

IV. It is neceſſary,* therefore, to admit, that there are branches of veins in the *uterus*, which paſs through its coat, naturally very thin, as has been remarked above: and which are generally ſhut, and folded at their mouths; but which, by dilating on neceſſary occaſions, open, project, and emit the blood into the *uterus*, without any fiſſure, laceration, or ſolution of continuity being made. This is a *firſt* ſtep towards the truth.

V. Theſe branches of veins may be detached from the trunks, whence they come, in two manners, either under an acute angle; or under a right angle. In the firſt caſe, the blood, only deviating little from its direction, would enter into theſe branches with all the velocity it has in the trunk; and conſequently would enter quickly, and copiouſly; which is not correſpondent to the ſlowneſs, and ſmallneſs of quantity, it flows with in the *menſes*, when women generally loſe only ſeven or eight ounces of blood in five or ſix days; and ſtill leſs to the manner, in which the blood muſt ſerve for the nouriſhment of the *fœtus*. For if it flowed quickly and copiouſly, into the ſubſtance of the *placenta*, as it could not be abſorbed with the ſame promptitude, by branches of the umbilical vein, it would overflow between the *uterus* and *placenta*, and, ſeparating them, procure inevitable miſcarriages.

VI. It

* The celebrated Dr. Mead comprehended, through force of genius, that, it was neceſſary, in order to explain menſtruation, ſuch a diſtribution of the veſſels as I have obſerved, muſt be ſuppoſed to be in the *uterus*. He ſpeaks thus, *Monitor. Mediocr.* Cap. XIX. ſect. 1. *Menſtruorum fluxum plerumque impedit ſanguinis lentor, quò fit, ut is canaliculos ad hunc effluxum naturâ comparatos, & ſphincteribus ſuis inſtructos, vi ſuâ aperire non poſſit. Neque enim, ut vulgaris fert opinio, arterias uteri ſingulis menſibus dirumpit ſanguis, ſed per ductas ſibi proprios, Naturæ legibus turgeſcens, foras exit.*

VI. It is neceſſary, therefore, to grant, that theſe branches of veins go off from the trunks at right angles. By this means, the derivation of the blood, that is made there, will be but ſparing and ſlow; becauſe the direction of the blood which may be thrown there, differs much from the direction of that which flows into the trunk; and by this means, the blood will not flow into the *uterus* or *placenta* but ſlowly and in little quantity, as we have ſeen it ought to do, according to the order of the animal œconomy. It muſt, therefore, be acknowledged, that the branches of the veins, which come from the trunk of the uterine veins, at right angles, pierce the internal coat of the *uterus*; and open naturally, when neceſſary, without any laceration; and form thoſe numerous holes, which are ſpread on the ſurface of the *uterus*; and have been ſeen by all the anatomiſts. This is a *ſecond* ſtep towards the truth.

VII. Laſtly, Highmore has ſeen theſe veſſels advancing, and projecting into the *uterus*, in a woman who died in the time of her *menſes*. I have ſeen them longer ſtill, and inſerted into the *placenta* of a woman who died in the ninth month of her pregnancy. In ſhort, theſe obſervations have nothing in them, but what is conformable to the laws of nature: according to which, every free and diſtenſible canal, that is dilated by filling, muſt elongate itſelf in proportion. It reſults, therefore, that it is proper to admit of there being in the *uterus*, 1° Veins, that pierce the internal coat of it; which are naturally cloſed at their extremities, but, by dilating, open without any laceration; which diſcharge then the blood; and have mouths that form thoſe holes obſerved by the anatomiſts: 2° Veins, that riſe at right angles, with the trunks from whence they come; in which only a ſlow and ſmall derivation of blood can be made: 3° Veins, which, in conſequence of being

tumefied by the milk that paſſes thither, elongate according as they dilate; and project into the *uterus*, till they inſinuate themſelves into the *placenta*, which adheres to it; and into which they diſcharge the blood ſlowly and ſparingly in proportion. This is the *third* and *laſt* ſtep towards the truth; for theſe veins, we have been deſcribing, are the veinous *appendices*, or cœcal veins, we have admitted; and which have a ſhare both in all the functions performed in the *uterus*; and in every diſeaſe, that happens to it.

VIII. Theſe veinous *appendices*, or cœcal veins, are the only way, by which the blood of the mother paſſes to the *fœtus*. Several anatomiſts have vainly pretended, this junction was performed by arteries: but ſuch an opinion is deſtitute of any foundation. All the blood, that iſſues from the *uterus*, in the *menſes*, pregnancy, and *lochia*, iſſues from the holes with which the coat of the *uterus* is ſpread; and theſe are ſo many mouths of very ſhort little veſſels, which come from the neighbouring veinous ramifications; and are conſequently truly veins, that bring, into the *uterus*, blood purely veinous; which is conformable to what we have ſaid in *remarks* II. and V. It is true, that injections, thrown into the uterine arteries, may paſs into the *uterus* by the holes of the interior coat; but they paſs thither more ſlowly, and with greater difficulty, than when they are forced into the veins: which proves, they do not paſs thither immediately from the ſame arteries; but that it is neceſſary, they ſhould firſt get through the difficult paſſage of the capillary branches of the veins and arteries, to arrive at ſome trunk of a vein, from whence ariſe the veinous *appendices*, which carry them to theſe holes.

IX. Still leſs attention ſhould be given to the anatomiſts, who endeavoured to eſtabliſh a reciprocal circulation between the mother and the *fœtus*, in ſuch manner, as ſuppoſed the branches of the uterine arteries

arteries to anaſtomatiſe with the branches of the umbilical vein; and the branches of the umbilical arteries with the branches of the uterine veins; ſo that the blood might continually paſs from the mother to the child; and repaſs back again from the child to the mother. But, beſides there being no ſuch union of the *placenta* with the *uterus* to be obſerved, how could it eſcape them, that, in order to make it reciprocal, it is neceſſary, the branches of the uterine arteries ſhould be detached from the *uterus*, and be elongated, in order to find the branches of the umbilical vein, and unite with them; that the branches of the umbilical arteries be detached, on their ſide, from the *placenta*, that they may go, and conjoin with the branches of the uterine veins; and that it is abſolutely impoſſible, theſe different veſſels, which are ſo unequally diſtributed in the *uterus* and *placenta*, can ever adjuſt themſelves to each other in a ſuitable manner? Mr. Mery of the Academy of Sciences, has, however, adopted that opinion in a memoir which may be found in the *Memoirs of that Academy*, *anno* 1702. But the judicious ſecretary of the Academy, who has made an extract of it, *page* 36 *of the Hiſtory of that year*, could not avoid perceiving the impoſſibility of it. "It is wonderful, *ſays he*, that conſidering how compact and "ſtrongly connected as to its parts the body of an "animal is, there ſhould be any new one added to "it, which can unite itſelf as ſtrongly as all the "others; and that, after being thus united, it can "be ſeparated without any injury to others."

X. A very ſingular obſervation led Mr. Mery into that opinion. "A pregnant woman, who was "near her time, was ſuddenly killed, by a very vio-"lent fall. There was found in the cavity of her "belly, ſeven or eight pints of blood, and all the "blood-veſſels extremely empty. Her child was "dead, but without any appearance of injury, and "all its veſſels were devoid of blood, as well as

" thoſe of the mother. The body of the *placenta* " ſtill adhered to all the interior ſurface of the " *uterus*, in which there was not any extravaſated " blood." M. Mery concluded from thence, that the blood of the *fœtus* muſt have paſſed into the veſſels of the mother; from whence it was diſcharged into her belly, only by the umbilical arteries, which had carried it into the uterine veins. This firſt point being allowed, he thought it followed, that the uterine arteries diſembogue the blood alſo into the umbilical veins: which conſtitutes a reciprocal circulation between the mother and the *fœtus*.

XI. But it is eaſy to explain the obſervation, that Mr. Mery relates, without admitting that hypothetical circulation. The veinous *appendices*, or cœcal veins, which are the only veſſels of communication there are between the *uterus* and the *placenta*, are not furniſhed with any valves; and are, conſequently, as capable of carrying the blood from the *placenta* to the *uterus*, as from the *uterus* to the *placenta*, according to the degree of force acting on one ſide or other. In the common ſtate, the blood is forced more ſtrongly by the uterine veins into the *appendices*, than it is returned by the *placenta*. It muſt, therefore, be then diſcharged from the *uterus* into the *placenta*, but in a very ſlow manner, as, we conceive, it is neceſſary it ſhould for the ſupport of the *fœtus*. It was quite otherwiſe in the caſe which Mr. Mery obſerved. There was no impulſive action on the ſide of the uterine veins, which were devoid of blood; but there was ſuch on the ſide of the *placenta*, as well in conſequence of its own reſilition, as by the compreſſion that it received from the *uterus*: the blood muſt therefore flow, or if that expreſſion be preferred, reflow from the *placenta* to the uterine veins, as long as there was any blood in the veſſels of the *fœtus*.

XII. Nothing remains now, but to ſatisfy the doubts of thoſe, who do not allow, that the mother gives

gives the *fœtus* only a veinous blood, groſs and thick, in the place of furniſhing it with an arterial blood, more light and proper to ſupport life. I have already ſhewn before, in II. and V. *remarks*, ſeveral reaſons to juſtify that way of thinking, which appears plauſible to me. I may add, it is not extraordinary, that the *fœtus* ſhould receive from the mother by the umbilical vein, a veinous blood, ſuch as that which it receives from all the parts of its body by other veins. But if theſe reaſons be not ſatisfactory, I leave it to thoſe who diſapprove of them, to endeavour to find out better. With regard to myſelf, as ſoon as I am certain of a fact, I take pains to ſearch for the final cauſes of it, which are ſometimes above our knowledge; and, I think, with Cicero,* who ſaid on a like occaſion; *Non quæro cur, quoniam quid eveniat, intelligo. . . . . Hoc ſum contentus quod etiamſi quomodo quidque fiat ignorem, quid fiat intelligo.*

Theſe are the elucidations, that I thought due to the doubts of M. Van Swieten. I wiſh, I may be happy enough to perſuade him of the reality of the veinous *appendices*, or cœcal veins of the *uterus*; and to merit his approbation of the uſe I attribute them, in the explanation of the functions proper to women,

*Sublimi feriam ſydera vertice.*

* Lib. I. *De Divinatione*, §. 9.

# DISSERTATION II.

*In which an anſwer is given to the critical Remarks on an Extract of the firſt volume of this work, inſerted in the* Journal des Sçavans, *of the year* 1762.

THE four firſt volumes of this treatiſe appeared in the year 1761. The *Journal des Sçavans* ſpoke of it in the *nouvelles litéraires* of the month of September, of the ſame year: and they gave two extracts of it in the following year, the one in the month of March, and the other in December. The author of theſe extracts heaped eulogiums on the work; for which I make my acknowledgments to him. But he mixt with his praiſes ſeveral critical remarks, on the firſt extract, though ſo fairly and politely, that I muſt, even with regard to them, repeat my thanks.

Theſe criticiſms do not regard medicine. They only turn on ſeveral points of literature or philology, and I might have diſpenſed with anſwering them, had they not oppoſed facts which I believe true; and which regard to truth obliges me to juſtify. I ſhall however do it in a ſummary manner: beginning with the principal article.

## I.

This article reſpects the age of *Johannes Fernelius*, at his death, in 1558. The queſtion is, whether he was ſeventy-two or fifty-two years old? The matter appears of very little importance, but it has been diſputed; I imagine from want of attention.

The

The first of these two arguments is founded, 1° on the express evidence of William La Planche, *(Plantius)* a native of Mans, and a Doctor of the faculty of Paris; who lived with Fernelius during ten years; was with him at his death; and to whom, when he died, he entrusted his Therapeutic, of which La Planche augmented the seventh book with notes; and printed it at Paris in 1567. This physician, who could not but be well informed of the matter, said, in his life, or rather, eulogium of Fernelius, that he died aged seventy-two years, *Anno vitæ suæ septuagesimo secundo:* which affords a proof that appears to be unanswerable.

2° There may be found in Plantius another date, no less conclusive. Fernelius, says he, was appointed first physician to Henry the Second, towards the sixtieth year of his age; *Annum tum ille quidam egebat ætatis suæ circiter sexagesimum.* It cannot therefore be true, that he died at the age of fifty-two.

3° Plantius relates in the life of Fernelius, the following facts:

That he applied himself to the study of letters when old: *natu jam grandis.*

That he was attacked, during his studies at Paris, with an obstinate quartan fever: which obliged him to put a stop to them, and return home: *febre quartanâ corripitur, quâ crudeliter & diù conflictatus cœptum studiorum cursum interrumpere; utque salubriore aere frueretur, solum vertere cogitur.*

That being returned, and having finished his studies, he taught philosophy for two years, at the college of Saint Barbe. *Philosophiam in gymnasio Barbarano publicè profiteri decrevit, . . . . . quod curriculum summâ cum laude absolvit.*

That he applied himself a long time to the study of mathematics and astronomy: and that his father-in-law had much trouble, to dissuade him from it, even after he was made a Doctor.

That he ſtudied phyſic for four years, *per integrum quadriennium*; and that being afterwards a graduate, he went through his degrees in two years, and was admitted to be a Doctor.

Plantius does not mark the date of any of theſe facts: but they may be otherwiſe known by the titles of the books themſelves, as Fernelius printed two works of aſtronomy: the one, in 1526, *in folio*, at Paris, by Colines, intituled *Monaloſphærium:* the other alſo printed at Paris, in 1528, by Colines likewiſe, under the title of *Coſmotheoria.*

Laſtly, it may be known by the regiſters of the faculty, that Fernelius had a *diploma* there in 1528 and 1529; and was admitted a Doctor the laſt of theſe two years.

Let us collate theſe facts with the opinion of thoſe who only give him fifty-two years to his death, in 1528. To ſupport this notion, he muſt have been born in 1506. Young men were far advanced in his ſtudies at that time, when they had finiſhed their humanities at twenty or twenty-one years: and this happened only to thoſe, whoſe education had been attended with particular advantages. Fernelius, who was deſtitute of fortune * and ſupport; who applied ſo late to ſtudy; and who had been interrupted in the courſe of his ſtudies by an obſtinate quartan fever; could not have finiſhed his humanities till the age of twenty-four or twenty-five, that is to ſay, in 1530, or 1531. How therefore could he compoſe a work of Aſtronomy in 1526, aged twenty years, and another of the ſame kind in 1528, aged twenty-two, in the time when he had ſcarce got through his claſſes? How could he procure a *diploma*

* It is proved by the titles, that Laurence Fournel, father of John Fernel, was of Mount Didier, and it is believed, that Fernelius was born there; that he went from thence to Clermont by Beauvoiſis, where he was keeper *(hoſte)* of an inn, at the ſign of the Swan. See Simon, *Supplement to the Hiſtory of Beauvoiſis, pag.* 45. *from Nobiliaire de Verm.*

*ploma* in phyſic, in 1528, aged twenty-two years, being ſtill only in the middle of his humanities, at a time when it is known, none were admitted till they were of the age of thirty-ſix or forty? How could he have ſtudied phyſic for four years before his being admitted a ſcholar: which would bring him back to the eighteenth year of his age; and conſequently to the beginning of his ſtudy of grammar?

All this, as is evident, is abſolutely impoſſible, according to the opinion of thoſe who only make Fernelius fifty-two years old: but it agrees perfectly with the opinion of thoſe, who make him ſeventy-two. According to them, he muſt have been born in 1486; finiſhed his humanities and philoſophy in 1510 or 1511, aged twenty-four or twenty-five; publiſhed his firſt work of Aſtronomy at the age of forty, and the ſecond at forty-two; have been admitted to be a graduate in the faculty at forty-two: and have had time to ſtudy phyſic four years before: in ſhort, all will then be feaſible, and conformable to the uſage of the preſent time.

4° I do not believe there need more convincing proofs of the age of Fernelius, at his death, than thoſe we have produced: but I muſt not neglect thoſe, that William Cappel, Doctor of the faculty of Paris, has furniſhed. Julian Paumier, Doctor of the ſame faculty, and a pupil of Fernelius, put into his hands a collection of ſeveral of his conſultations, in order to their being reviſed and printed. Cappel did it in 1585; and, in a dedicatory epiſtle, addreſſed to Paumier, gave Fernelius the epithet of old man (*ſenex*); as Scevole, of St. Marthe, did alſo, in the *premier livre de ſes éloges*; which may well ſuit a man who died at ſeventy-two years old; but I cannot believe they ever thought of giving it to one, who died at fifty-two.

Such are the proofs of thoſe who believe Fernelius was 72 years old at his death. There is no neceſſity to conceal, that thoſe, who have thought the con-

contrary, alledge on this ſcore two very plauſible proofs: the *one* of which is taken from the regiſter of the faculty of Paris; and the *other* is the epitaph taken from the tomb-ſtone of Fernelius; which merit examination.

As to the firſt, it is an ancient cuſtom, and conſtantly obſerved in the faculty of Paris, that the acting dean writes in the regiſters, ſuch events, as happen during his being in office; and which may intereſt the faculty. Anthony Dufour, who was dean the year of Fernelius's death, did not omit to make an honorable mention of him in the regiſter. The chief of what he ſaid is as follows.

*Die 26 Aprilis, 1558, magno ordinis noſtri & totius Galliæ incommodo obiit clariſſimus ac doctiſſimus Vir Johannes Fernelius, Regis primarius Medicus, in cujus locum ſuffectus eſt Vir eruditiſſimus & prudentiâ ſpectatiſſimus Johannes Capellanus.*

He does not ſpeak there, as has been ſeen, of the age of Fernelius at his death; but twenty-ſix pages further, and at the end of the dean's account, there is found in the regiſter a blank page; of which, Guy Patin, elected dean in 1650, and conſequently keeper of the regiſters, took an opportunity of making uſe, by putting in, with his own hand, what follows.

*Magiſter Johannes Fernelius, Claromontanus Bellovacenſis, Chriſtianiſſimi Gallorum Regis Henrici II. Medicus primarius, omnium à Galeno Medicorum præſtantiſſimus, & ſcientiſſimus, homo ſummo ſuo jure Gallicus Hippocrates dictus, vir bono publico ad omnia natus, Philoſophus & Medicus acutiſſimus & ſolertiſſimus, Scholæ Medicæ Pariſienſis ſingulare lumen ac decus eximium, elegantioris Medicinæ à domitâ & profligatâ Pœnorum barbarie Actor puriſſimus, ſummo humanæ Gentis detrimento, maximo totius Galliæ luctu, æterno omnium bonorum mœrore, moritur Pariſiis, die 26 Aprilis, anno Chriſti Salvatoris 1558, ætatis 52, immortali vitâ digniſſimus. Jacet in æde*

*Deo*

*Deo ſacrâ ſub invocatione divi Jacobi de Macello, juxta Chorum. Quieſcat in pace vir innocentiſſimus, eloquentiſſimus ac eruditiſſimus. Tibi vero, Lector, adveniat quod ei optaveris.*

*Quantum ſcire hominem divina potentia vellet*
*Oſtendit terris, Ferneliumque dedit.*

*Mœrens ac dolens, vivaſque lacrymas profundens in tanti Archiatri popularis ſui memoriam, mortalitatis memor, quaſi juſta ei perſolvens ſcribebat die Mercurii ſeptimâ Junii anno* 1651. *Guido Patin, Bellovacus, Doctor Medicus Pariſienſis, & ſaluberrimæ Facultatis Decanus, poſt annos à morte Johannis Fernelii* 93.

It may be ſeen, conſequently, that what was written by the Dean, who was on the ſpot, at the death of Fernelius, mentioned nothing of the age he was when he died: which prevents the fact being thus proved. It was Guy Patin, only, who put in ninety-three years, after what is there found reſpecting this article. Now the authority of that phyſician, who ſpoke of a fact which happened a long time before him, merits no regard. The diſpoſition which he had to adopt vulgar reports is well known: and his letters are a very good proof of it. But it is aſtoniſhing, that Guy Patin, who knew that what was in the regiſters could not prove the fact, as he had inſerted it there himſelf, did nevertheleſs make uſe of it himſelf as a demonſtrative proof, in the letter he * wrote to M. A. F. D. M. That is to ſay, as I imagine, to Mr. Andrew Falconet, Doctor of phyſic at Lyons, the ninth of April, 1657. " As " you are printing ‡ Fernelius, *ſays he to him*, I de- " ſire one thing of you; which is to correct a fault " that † has been made in the impreſſion of Utrecht, " where they ſay, in his life, ‖ that he was ſeventy- " two years old when he died: which is very falſe. " . . . I

* *Tome* I. *Lettre* CXVIII.

‡ At Lyons.

† That is the Utrecht edition of 1656, *in quarto*; in which they have followed the precedent of the Paris editions.

‖ It is the life of Fernelius by Plantius, that is put at the head of this edition.

" . . . . I have two certain proofs of it: the *one* is " taken from the regiſters of our faculty, when I " had them in my hands, whilſt I was dean: in " which it is expreſly mentioned, that Fernelius died " the twenty-ſixth of April, 1558, *anno ætatis* 52. " *The other* proof is from his Epitaph, at St. Jaque " de la Boucherie, . . . where it is, alſo, mentioned, " that he died at the age of fifty-two years."

I had conſulted the regiſters of the faculty; and knew what Guy Patin had added; when I wrote the chronological catalogue, that is at the end of the fourth volume of this work. In order to ſet aſide the arguments, they pretended to draw from the paſſage in the regiſters, I believed, there was reaſon to ſay, the regiſter had been *retouched* by Guy Patin: and it was a term I choſe, as being a very gentle one, to expreſs this phyſician's deſign. But this term has not pleaſed the author of the extract; and brought upon me a very ſmart cenſure from him. " Mr. Aſtruc, *ſays he*, who knows how much au- " thenticity is neceſſary for public regiſters, will " not perhaps be excuſed eaſily for having ventured " that expreſſion. Being a member of the faculty " of medicine at Paris, he had an eaſy way to elu- " cidate his doubts. He might have demanded a " ſight of the regiſters of his body: and he would " have ſeen a complete ſeries of theſe regiſters, " written even with the hands of each ſucceſſive " dean."

I had taken, as I have ſaid, this advice of the author of the extract. I had conſulted the regiſters of the faculty; and had ſeen the addition that Guy Patin had made, with his own hand, twenty-ſix pages after what had been written by Anthony Dufour; who was dean of the faculty at the time of Fernelius's death. The author of the extract agrees to the truth of this fact; ſo that hitherto we concur as to the eſſential part. In theſe circumſtances I thought I might ſay, the regiſter had been *retouched* by Guy Patin.

Patin. If that expreſſion diſpleaſed him, I beg, he would tell me, what other this matter merited. But, in the mean time, I deſire to have leave, to reject the authority of the regiſters, as to what regards the age of Fernelius at his death.

The article of the epitaph of Fernelius is more difficult to be got over. Fernelius was interred with his wife, in the church of St. Jacques de la Boucherie, his pariſh. There was laid over his tomb, a ſimple ſtone with an inſcription, which has been very much effaced a long time. But M. Villain, who gave us, ſeveral years ago, an *Eſſai de l'Hiſtoire de la Paroiſſe de S. Jaques de la Boucherie*, ſays, *pag.* 179, and 180, that this inſcription is found in the collection of epitaphs, which, as he ſays, is in the library of the city; and that it is expreſſed in theſe terms:

*Cy-giſt le corps de noble Homme & Sire M. Jean Fernel, en ſon vivant Docteur en Medicine, & premier Médecin du Roy Henri II. qui trépaſſa le mardi* 26 *Avril*, 1558, *& Demoiſelle Magdeleine Tournebue ſa* * *Femme, qui trépaſſa le* 10 *jour d'Avril*, 1557. *Priez Dieu pour eux.*

They do not ſpeak, as may be ſeen, in this epitaph, of the age of Fernelius when he died; but there is, in the ſame church, another epitaph in Latin, and longer, on a tablet of braſs, fixt to the wall over-againſt the monument; on which are put the following words, written in a modern character, which contain a florid commendation of Fernelius; and

* It is certain that the wife of Fernelius only died a few days before him; ſo that it is reaſonable to imagine it was on the 10th of April, 1558, tho' it is found in the epitaph, to be on the 10th of April 1557. Becauſe at that time they began to reckon the new year from the day after the feaſt of Eaſter; and Eaſter fell that year on the 10th of April; whence they ſtill reckoned that day in 1557, though it was in 1558, in reckoning from the month of January, according to the preſent manner.

and in which is to be remarked, at the end, in Roman figures, the age of Fernelius, at his death, in these terms, *vixit annos* LII. The following is faithfully copied from it.

*D. Immortali, Opt. Max. & Christo Jesu Hominum Salvatori sacrum.*

*Johanni Fernelio, Ambianensi, Henrici* II. *Galliarum Regis Consiliario & primo Medico, nobilissimo atque optimo ; reconditarum & penitus abditarum rerum scrutatori & explicatori subtilissimo ; multorum salutarium medicamentorum inventori ; veræ germanæque medicinæ restitutori ; summo ingenio, exquisitâque Doctrinâ Mathematico ; omni in genere Philosophiæ claro ; omnibus ingenuis artibus instructo ; temperatissimis, sanctissimisque moribus prædito ; socero suo pientissimo Philibertus Barjotius, supplicum libellorum in regiâ Magister, magnique Regis Consilii Præses, affinitate gener, pietate filius, mærens posuit. Anno à salute mortalibus restitutâ,* M. D. LVIII. *obiit* 26 *die Aprilis* M. D. LVIII. *vixit annos* LII.

It is very singular to have, in the same place, two different epitaphs of the same person. As that, which is on the tablet of brass fixt to the wall, is evidently more recent than that on the sepulchral stone, which covers the tomb of Fernelius : and as it is composed in a more florid stile ; and contains an eulogium much resembling that, which Guy Patin wrote in the faculty's register, and which we have mentioned : I conjectured, that Guy Patin was the author of it ; and that Philibert Barjot, master of the requests, who put it there, was a grand-child of Fernelius; and I have said so in the fourth volume of this work, *pag.* 222. But I am mistaken in both the articles. Barjot, who put up this inscription, was son-in-law to Fernelius, as the inscription says : and the inscription is much more ancient than Guy Patin : because D. Jaques de Breuil cites it, in his *Théâtre des Anti-*

*Antiquités de Paris*, *pag.* 865; which was printed at Paris, *in quarto*, by Claude la Tour, in 1612.

Whoever was the author of that epitaph, I conſider it as the cauſe of the common error reſpecting the age of Fernelius; which has been followed by ſo many authors; and which has been adopted with ſo much heat, by Guy Patin, who was accuſtomed to conclude haſtily, and without much reflexion. As to myſelf, I was cautious in giving the ſame authority to that inſcription: and believing, that it ought not to prevail againſt ſo many proofs as have been brought to the contrary, I was more diſpoſed to conjecture, that there was an error in the inſcription; and that, inſtead of *vixit annos* LII. it ſhould be read *vixit annos* LXXII. as Bayle thought,† whoſe ſentiment, with regard to the age of Fernelius, was the ſame as mine; though he had not, from the regiſters of the faculty and the epitaph, the ſame lights as I have procured.

## II.

We ſhall not dwell ſo long on the other remarks of the author of the extract. I have ſaid in the chronological catalogue of the fourth volume, *page* 165, 166, that, in the ſecond *epocha* of the hiſtory of medicine, which I make to begin eight hundred years after J. C. the ſtudy of medicine, and the polite arts, had declined among the Chriſtians, and ariſen among the Arabians; whoſe empire then flouriſhed; and where it maintained its ground till 1200. In this I advanced nothing but what is conformable to the unanimous teſtimony of hiſtorians; and I believe it uſeleſs, to undertake to prove it. It is true, that Charlemagne made ſeveral efforts, in order to re-eſtabliſh the ſciences in his ſtates; but they were not ſucceſsful. The civil wars which diſturbed the reign of Louis le Debonnaire, his ſon, and thoſe of his children, and the ravages which the eruptions of the

† Diction. Hiſtoriq. & Critiq. under the word *Fernel.* n. H.

the Normans made in France, replunged the nation into ignorance. In these four centuries, there was only found, one medicinal work, written by the Christian physicians: whereas there were many found written by those of Arabia. There did not appear, in Europe, any physician of eminence. Among our kings, we know of only Charles le Chauve who had one; and he was a Jew, called Sedécias, who poisoned him.

The author of the extract is of a contrary sentiment; and believes that medicine shone among the Christians even in these centuries. In order to prove it, he has taken the pains to peruse *l'Histoire litteraire de la France*; in which, he has found some monks, particularly Gerbert, who was afterwards pope, under the name of Sylvester II. and Fulbert, Abbon; who wrote nothing on medicine; but have inserted several trivial receipts, kept by tradition in their monasteries. All the answer I shall make is, to refer to what the authors themselves of this work have said, *tom.* VI. *pag.* 66. I should have thought medicine lost; if it had ever happened, that we should have had only such doctors. As to Jean de S. Amand, and Pierre d'Apone, whom the author of the extract quotes, they cannot serve to support his opinion; since they lived in the thirteenth century, in which medicine began to be revived in Europe.

## III.

I have said in the beginning of the second *epocha* of medicine, *pag.* 166, 169, that the knowledge of physic, which was preserved by the Arabs or Saracens, was communicated gradually, towards 1100, to the inhabitants of the kingdom of Naples, and to those of the lower Languedoc, with whom the Saracens had intercourse: that in consequence of this, the two most ancient faculties in Europe were formed; those of Salerno and Montpellier: that

that from thence the ſtudy of medicine extended itſelf from place to place over the reſt of Europe: and that, by the example of theſe two faculties, there have been many others ſucceſſively formed.

The antiquity, I gave to the faculty of Montpellier, has likewiſe diſpleaſed the author of the extract. He admits, *that the doctrines of the Arabs was taught at firſt in the city of Montpellier, and perhaps a good many years before they penetrated into the other provinces:* but as if the doctrines of the Arabs, at preſent in queſtion, could be diſtinguiſhed from medicine, he pretends, it *does not follow from thence at all, that medicine was entirely neglected; and that it was not taught elſewhere then, beſides at Montpellier; and even before it was taught in that city; by public profeſſors.*

We ſhall ſee in the following *article*, that the doctrines of the Arabs and medicine itſelf are abſolutely the ſame thing; and that the diſtinction he would make is entirely frivolous. The only queſtion here is, Whether Montpellier be the firſt city of the kingdom, in which medicine has been taught; and the firſt, in which there was a faculty eſtabliſhed? or if medicine has not been taught elſewhere *(in all appearance at Paris)* at the ſame time, as at Montpellier, and *even before*; and if a faculty has not been inſtituted there before that of Montpellier? Theſe are, as we ſee, the queſtions he makes, which we have only to reduce to reſpective articles.

What we may alledge with regard to Montpellier is, 1° There was, in this city, in 1100, a celebrated medicinal ſchool, where they aſpired to have the ſole privilege of teaching; and where they obtained an excluſive right from the *Guillaumes*, lords of the city, in conſequence of ſolicitations or premiums of money. As this monopoly was contrary to the good of the ſchool and the advantage of the city, Guillaume, ſon of Matilda, promiſed to the inhabitants in 1180, by a

public act,* which subsists in the archives of the Hôtel of the city, not to suffer himself to be induced by petition, money, or solicitation, *prece aliquâ, vel pretio, seu sollicitatione alicujus personæ*, to restrain, in the least, the physicians from the right of teaching medicine in the school of Montpellier; but to permit any persons whatever, to give lectures, from whatever place they should come, *quicumque sint, & undecumque sint*; to which he desired his successors to conform.

2° This school received soon after a fixt and certain form, by a bull, that the cardinal Conrad, bishop of Porto and St. Ruffine, legate of St. Siége in Languedoc, against the Albigeois, gave to Montpellier, the XVI. of the calends of September; that is to say, the fifteenth of August, in the year 1220. By this bull, the right of teaching medicine at Monpellier was confirmed to the professors; authority was given to examine candidates who desired to be admitted as lecturers; and, if they were found capable of teaching, they were required to apply to the bishop of Maguelone, from whom they were to receive a licence; it was prohibited those who were not admitted to the privilege in this manner, to exercise any function of this kind; that is to say, the medicinal school of Montpellier, was founded as a faculty of medicine, with a legal title, of which two original deeds subsist: the one, in the archives of the bishoprick; and the other, in those of the faculty. This bull was confirmed in 1230, by the cardinal Guy Papa, bishop of Sora, legate of St. Siége; in 1257, by pope Alexander IV. and, since, by a long series of pope's bulls; and letters patent from our kings. Cardinal Conrad's bull is too long to be transcribed †; but I will relate what he said of

* Gariel, *Series Præsulum Magalon. pag.* 155.
Degrefeuille, *Histoire Ecclesiastique de la ville de Montpellier, pag.* 342.

† It may be found in the Ecclesiastical History of the city of Montpellier, by M. Degrefeuille, page 343.

of the antiquity of the school at Montpellier. *Sanè cùm dudùm Medicinalis Scientiæ professio sub gloriosis professum titulis in Montepessulano claruerit, floruerit, & fructuum fecerit ubertatem, multipliciter in diversis mundi partibus salubrem.*

3° The faculty of Montpellier is the first, in which was given a public course of anatomy. There was obtained for this end, in 1366, of Louis d'Anjou, governor of the province, the right of the dead bodies of criminals, that were executed; which has been several times since confirmed.

4° The faculty of Montpellier was the first, in which there was established a royal garden of plants: and a botanical professor to explain them. The professorship was created by Henry IV. in 1593: and the royal garden established and laid out in 1598.

5° Lastly, the faculty of Montpellier gave the first public course of chemistry, which Louis XIV. established in 1673; in order to which, he instituted a new professorship; and annexed a salary.

In a word, the medicinal school of Montpellier has subsisted these six or seven hundred years. It was erected into a faculty in 1220. Medicine has been there constantly taught without intermission; and there is a catalogue of the principal doctors, who gave lectures before the establishment of professors with stipends; and of all these professors since their institution. Finally, it is a long time they have publicly, every year, given courses of anatomy, botany, and chemistry; and that there have been professors and demonstrators to give them.

Such are the pretensions of the faculty of Montpellier, simply enumerated. I wait for the author of the extract to produce his; and I assure him, of the sincere disposition in which I am, to submit to them, if he himself, whose penetration and knowledge are known to me, judge, that they are sufficient to prove, that "medicine was taught elsewhere "than at Montpellier in 1100; and even before it

" was in this city, by public profeſſors," as he has advanced.

## IV.

The author of the extract reproaches the faculty of Montpellier for their attachment to the Arabian medicine. " The commerce of the Arabs, *ſays he*, " with our ſouthern provinces, brought thither, at " firſt, their knowledge ; their medicine was thus " known, cultivated, and taught at Montpellier. " . . . . This is, *adds he a little lower*, the origin of " the ſchool at Montpellier ; and the obſtinate ad- " herence to the doctrines of the Arabians, with " which they have been reproached."

The Arabian medicine has, for a long time, been decried. We have ſeen heretofore, page 426, what Guy Patin ſaid of the barbariſm of the Arabs ; whom he called *Pœni*. How many times, and in how many ways, have not the phyſicians of Montpellier been reproached for teaching and following the practice of the Arabians, and ſlighting that of the Greeks ? But theſe are prejudices without foundation ; and which it is eaſy to remove by the following remarks.

1° The barbariſm with which they ſo much reproach the phyſicians of Arabia, ought not to be imputed to them. They wrote very well in their own languages ; Avicenna in particular paſſes for an Arabian author, whoſe ſtile is very correct. The barbariſm of their tranſlations proceeds from the ignorance of their tranſlators, who knew neither Arabic, Latin, nor phyſic : and who have perverted, in almoſt every line, the ſenſe of the authors which they tranſlated.

2° The medicine of Arabia, which they affect to decry, was that of Greece itſelf ; and was taken from Galen and Hippocrates, of whoſe works the Arabians had tranſlations in their own language : and whom they

they often quote. It is easy to gain a conviction of this, by reading attentively an Arabian author, or, at least, any of the physicians, who have written, in Europe, before the revival of the Greek language, who copied word for word the Arabians, that were their only guides. There may be placed in this number, Nicholas Bertrutius, Bernard de Gordon, Jean Platearius, Valescus de Tarenta, Mark Gatinaria, &c. They all availed themselves of the name of Hippocrates or Galen; either because they borrowed the quotations the Arabs had made from them; or because they took them from the bad translations, that were made, in Latin, of some works of these Greek physicians, upon other Arabian translations.

3° Whatever the Arabian medicine may be, it is right to acknowledge that it was followed by the faculty of Montpellier; but it was followed, even at the same time, by the faculty of Paris. I know of no physician of that faculty, who wrote in that *epocha*, but Jacques des Parts, *Jacobus de Partibus*. What is his *Explanatio in Avicennam unà cum textu ipsius Avicennæ à se castigato & expositio*, printed at Lyons in 1465, *in folio*, but the very matter of all the Arabian medicine? What M. Chomel said of that work, may be seen *Essai Historique** *de la médicine de France*. What were the books taught at that time, in the faculty of Paris? M. Chomel has taken care to extract a list of them from the registers; and to insert it in his work†. In this may be found Isaac, and all his different works; Joannitius, called also the Humane; Avicenna; and Rhazis; that is to say, the principal Arabian physicians; to whom, may be joined Constantine, born at Carthage, of the Christian religion; who went into Italy in the eleventh century; was made a monk of the monastry of Montcassin; and had applied himself, all his life, to translate the Arabic works into Latin:



* In the *Catalogue* of the first physicians of the kings of France, *pag.* 17, 12.

† *Pag.* 117, 127.

among others, the *Viaticum* of Isaac; which has been a long time attributed to him, as his work.

4° This method was not peculiar to the faculties of Paris, and Montpellier. It was a long time common to all the European faculties. I shall only quote one proof, and that but briefly, taken from Janus Cornarius; who, in his preface to his translation of Paul d'Egine, speaks thus of the preceding time: *Prælegebatur Avicenna, qui Princeps totius artis habebatur & appellabatur. Prælegebatur Rhazis, & præsertim nonus ipsius ad Almanzorem Regem liber, in quo absolutæ curandorum omnium morborum ratio proponi ferebatur.*

5° It is true, Mr. Chomel adds, that they read in the faculty of Paris, the Aphorisms, Prognostics, and several other such little treatises of Hippocrates. They read the same, in that of Montpellier, as it would be easy to prove. But these books, such as they were, were not better than those of the Arabians; because they were barbarous translations, made from those of the Arabians: as Melchior *Adam has said: *Æquè vitiosi Hippocratis exiguâ mole libelli habebantur, corruptissimi & barbarissimi, qui interdùm etiam in Scholis . . . . prælegebantur.*

6° But lastly, when the Greek tongue had been brought into Italy and France, towards the end of the XV. century, several physicians, who learnt it, read Hippocrates, and Galen, in the original; and the others availed themselves of the translations they made of it. Application was made to the study of the Greek physicians, and the eagerness was as great at Montpellier as at Paris: as may be judged by the works of the physicians who have taught there since, such as Fontanon, Joubert, Varandé, Hucher, Ranchin, and Riviere. Perhaps even they did not apply to the study of these physicians so much at Paris as at Montpellier; as they appear to have a long

* In vitâ Jani Cornarii.

long time turned more to the ſtudy of nature, which may have furniſhed more uſeful and certain knowledge.

## V.

The laſt remarks, I have made, may cauſe me to be ſuſpected of ſome partiality for the faculty of Montpellier; though this ſuſpicion ſhould not take place, as I have only related ſimple facts. But when there has been occaſion to make a deciſion, it may be fixed as certain, that I have kept the ballance perfectly equal, between two faculties that intereſt me alike. I have ſtudied medicine in the faculty of Montpellier; I have taken my degrees in it; I was choſen for eight years by the ſame faculty, to give lectures there for M. Chirac, while he was in Italy, or Spain, with the duke of Orleans; at length, I ſucceeded him, and I have been profeſſor in my own right for ten years. I ſhould be ungrateful, if that faculty was not dear to me. But that of Paris is not leſs ſo. I have been received there with diſtinction; I have been honored with the eſteem and friendſhip of my new colleagues; and I live with them, and amongſt them, in the moſt perfect union. Theſe are all ſo many connections, which are not leſs ſtrong, and even ſubſiſting at preſent. Moreover, in conſidering the facts that I relate, what I have allowed to the faculty of Montpellier are only antient titles of nobility, honorable, it is true, but of little uſe: whereas, I have acknowledged, that Paris has more real and important pretenſions. It is compoſed of a great number of individuals, greatly informed of all branches of theory, and very well verſed in practice, by the number of patients, that occur in ſuch a vaſt city: and what is moreover an advantage of no little conſequence, it is eſtabliſhed in the capital of the kingdom; the reſort of all Europe; in which all the ſciences flouriſh; in which may be found all the books that may be

wanted; and in which the neceſſary ſuccours to elucidate any doubts, may be obtained.

In this ſtate of the faculty of Paris, can they envy any thing reſpecting that of Montpellier? What reaſon, therefore, for thoſe bitter reproaches ſo ill founded, and ſo often repeated? Is it deſired, very improperly, to render rivals two faculties, deſigned only to be competitors, ſtriving in concert to give perfection to the art of medicine, and to bring up ſtudents, who may ſupport and perpetuate it with honour?

FINIS.

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WORMS, *ſeminal*, how formed. See *Animals*.

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